



Restricted Conditions During the COVID-19 Pandemic: A Study on the Correlation Between Work Environment and Work-Family Conflict

Fan Yang^(✉)

Rutgers University, 57 US Highway 1, New Brunswick, NJ 08901-8554, USA
violetyoung0224@gmail.com

Abstract. At the beginning of 2020, the COVID-19 pandemic hit the world, causing numerous changes in people's lives and working styles. Since more and more employees have to work from home, less is known about how an adequate work environment at home influences these employees' perceptions of work and family conflicts. Building on Conservation of Resources Theory, this paper studies a sample of 202 Chinese workers who worked at home during the outbreak of COVID-19. SPSS software was used to analyze the combined data. Then this study established a Work environment and Work-Family conflicts model and Linear Regressions of emotional exhaustion, WIF, and FIW. Besides, gender moderated this relationship such that males saw a stronger influence of adequate work environment on work-family conflict compared to females. This study provides a theoretical implication about the effects of the quality of work environment at home on the work-family conflicts under the COVID-19 pandemic.

Keywords: COVID-19 · work environment · emotional exhaustion · work-family conflicts · Work environment and Work-Family conflicts model · Linear Regressions · conservation of resources theory

1 Introduction

At the beginning of 2020, the COVID-19 pandemic hit the world, causing numerous changes in people's lives and working styles. According to the U.S. Bureau of Labor Statistics, more employed workers had to work from home during the pandemic in 2020, rising the percent of people working from home to 42 from 22 of 2019 (BLS, 2021). In consideration of this fact and the continuation of the COVID-19 pandemic in 2022, it's important to explore the effects of people working from home and the potential work-family conflict. *Work-family conflict* is defined as “a form of interrole conflict in which the role pressures from the work and family domains are mutually incompatible in some respect” [7]. Scholars often differentiate *work interfering with family* (WIF) from *family interfering with work* (FIW), in which WIF refers to “requirements in the work domain that impede performance in the family domain” [17] while FIW is defined as “family demands that impede performance in the work domain” [17]. Previous studies have found that work-family conflict decreased life satisfaction [16] and increased emotional

exhaustion [6]. To mitigate or avoid these negative impacts caused by work-family conflict, scholars often aim to identify factors that might influence work-family conflict. They have explored the main cause of work-family conflicts which is the uncoordinated demands from family and work [7]. More specifically, the work-family conflict is brought by job demands on family issues whereas the family-work conflict is brought by family demands on the job [17].

Although previous studies have explored many antecedents of work-family conflicts, the situation under the pandemic has not been studied fully. First, the setting of the COVID-19 pandemic is quite different from normal work settings in previous studies. In a normal work setting, the decision of working from home is often made by a company in the consideration of daily work arrangements and its employees' abilities and willingness. However, the sudden breakout of the pandemic forced employees to work from home, regardless of their readiness for this new type of work style. The pandemic thus makes this study very meaningful in some special cases such as future pandemics or rainstorm/snowstorm situations.

Moreover, although some researchers have done studies about work-family conflicts during the COVID-19 pandemic [3, 12, 15], the number of studies on work environment impact is limited in the field. *Adequate work environment* is defined as “favorable conditions to work from home” [2]. An adequate work environment is significantly important for increasing employee’s job satisfaction [8], improving employee’s health [10], and decreasing emotional exhaustion [14]. The importance of an adequate work environment was highlighted in the pandemic because many people needed to work at home which was a fixed environment not originally designed for work. Yet, how, why, and under what conditions such an environment influences work-family conflict remain questions.

To fill these gaps, our study was designed as follows. The research question of this study was how an adequate work environment at home during the pandemic affected employees' work-family conflicts (both WIF and FIW). By using a sample of 202 full-time employees in China, this study explored the mediating role of emotional exhaustion and the moderating role of gender (only dichotomous categories -female and male- were considered). The research model of this study is depicted in Fig. 1.

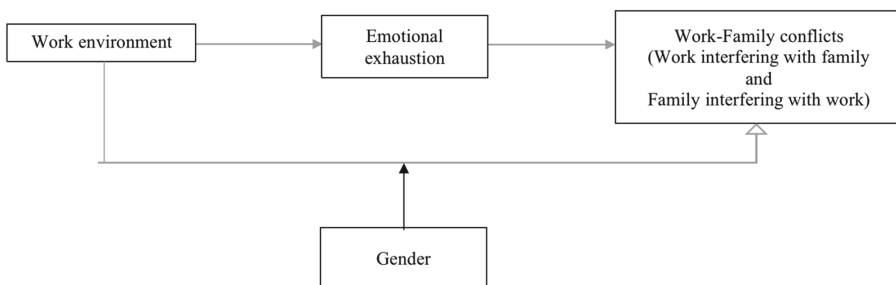


Fig. 1. Work environment and Work-Family conflicts model.

2 Theory and Hypotheses

Conservation of Resources (COR) Theory [11] states that people value resources they own so much that they are willing to do everything to gain resources. Negative emotions such as stress will come to people when they lose certain resources, which is the situation people want to avoid. If losing is happening, people will try their best to make a net loss of resources at a minimum and may also make investments in other resources. Here, resources consist of object resources (e.g., home), conditions (e.g., marriage, tenure, or seniority), energies (e.g., time, money, or knowledge), and personal characteristics that are helpful for people being resistant to stress [11].

2.1 The Impact of Adequate Work Environment on Work-Family Conflict

Working in an inadequate work environment reflects that employees might be distracted when working [2], which will in turn decrease their work efficiency. Therefore, they will have less time interacting with their family members. Besides, an inadequate work environment also includes insufficient or inappropriate work tools [2], which will decrease employees' productivity. They may need to invest more time in work compared to being in an adequate work environment, which means less time for family. Finally, the employees might not be ready for working from home since they had no choice at first place because of COVID-19, they might not have the ability to deal with work issues at home. These three reasons combined will cause the conflicts of work interfering with family.

Things will be similar for the conflicts of family interfering with work. Working in an inadequate work environment might make the employees be distracted by family issues or the noise of family members, which will negatively affect their work efficiency. Besides, the employees might not have the ability to solve the family issues at that time when working from home, thus the conflicts between family and work will increase. In contrast, without the distraction of noise and family issues, employees can somehow reduce the negative impact of family on work in an adequate work environment.

Hypothesis 1a: Adequate work environment at home will be negatively related to WIF.

Impacts on work

Hypothesis 1b: Adequate work environment at home will be negatively related to FIW.

2.2 The Mediating Role of Emotional Exhaustion

The work environment does have impacts on emotional exhaustion according to past studies. Rathert and her colleagues (2012) examined the impacts by their cross-sectional tests and found that a dissatisfied physical work environment would increase emotional exhaustion among workers, which suggested a negative relationship between adequate work environment and emotional exhaustion. Plus, according to COR Theory, without an adequate work environment, workers might feel their resources are threatened. Then, negative emotions like stress and even emotional exhaustion will occur [11].

Emotional exhaustion caused by an inadequate work environment will probably lead to the reduction of work efficiency since workers have no energy or mood to work. Thus, the time for family off work will decrease, which will cause the conflicts of work interfering with family. Besides, emotional exhaustion might decrease the social interaction between the workers and their families since the workers might not have the mood to interact. In this way, the relationship with family members might be damaged, which might disturb the employees' normal work. Therefore, the conflicts of family interfering with work will arise.

Combining the negative relationship between adequate work environment and emotional exhaustion, and the positive relationship between emotional exhaustion and work-family conflicts, we expect a mediating role of emotional exhaustion on the relationship between adequate work environment and work-family conflicts.

Hypothesis 2a: Emotional exhaustion will mediate the relationship between the work environment and WIF.

Hypothesis 2b: Emotional exhaustion will mediate the relationship between the work environment and FIW.

2.3 The Moderating Role of Gender

Many studies have explored the difference of work-family conflicts perceived by different genders (female and male) brought by many reasons. One study among them emphasized the "high involvement in nontraditional roles" which means working roles for females and family roles for males [4]. They argued that the high involvement increased work-family conflicts both in males and females [4]. Building on their argument, we expect that working from home without an adequate work environment can increase the possibility of males being involved in family roles, since males may be interrupted by their family when working. In addition, males may be expected to achieve high accomplishments on work since their traditional role is work. So, they will pay more attention to work even if they are at home. Therefore, work-family conflicts will arise. While, females may be affected less by the work environment at home than males since their supposed traditional main roles are family roles. Besides, females might be used to interacting with family members at any time, as performing their traditional roles [4]. So the quality of work environment does not make a big difference. While, males might not be used to interacting with family members when working from home, so they will receive a bigger impact of adequate work environment that protects them from family distraction.

Hypothesis 3a: Gender will moderate the relationship between work environment and WIF, such that, compared to females, males will see a stronger influence on the adequate work environment.

Hypothesis 3b: Gender will moderate the relationship between work environment and FIW, such that, compared to females, males will see a stronger influence on the adequate work environment.

3 Method

3.1 Procedure

The items in the questionnaire were originally from previous scales in English and we translated them into Chinese. The data were collected via Wenjuanxing, a crowd-sourced survey platform in China. There were sixty-seven questions in total, including participants' demographic information, work-family experience during the COVID-19 pandemic, and one question for attention check. A total of 202 valid responses were collected. SPSS software was utilized to analyze the consolidated data.

3.2 Participants

267 Chinese residents who worked at home during the COVID-19 pandemic in 2020 were given a questionnaire of this study. After removing some ridiculous responses like having 60 rooms and at the age of two, 202 responses were included for analysis with the response rate being 75.66%. The average age of these participants was 30.49 years ($SD = 5.77$), and there were slightly more males (51%) than females (49%). The professions of these participants were diverse, including teachers, engineers, and designers; with 32.4% being ordinary staff members, 40.4% being line managers, 24.5% being middle managers, 2.7% being top managers. The participants were from twenty-six provinces in China, distributed in China's east (34.04%), south (14.89%), central (14.89%), north (14.36%), southwest (13.30%), northeast (5.85%), and northwest (2.66%) areas. Among these participants, 88.8% were married and 11.2% were not. The average number of children these participants had was 1.91 ($SD = 0.56$) with a minimum of 1 and a maximum of 3.

4 Measures

Adequate Work Environment. The adequate work environment was measured by a four-item "telework environment" scale developed by Carillo et al. (2021) (1 = strongly disagree, 7 = strongly agree, $\alpha = 0.74$). This scale was adapted by Carillo et al. (2021) from those in Newman (1997)'s study by adding the circumstance of the COVID-19 pandemic [2]. Sample questions included "It is easy to get distracted working at home" and "I am bothered by the noise in my work at home" [2].

Work-Family Conflict and Family-Work Conflict. Work-family conflict and family-work conflict were measured together by the Bi-directional Scale of Work-Family Conflict proposed by Zhao et al. (2011). There were eleven questions in total on a seven-point scale (1 = strongly disagree, 7 = strongly agree, $\alpha = 0.89$ for WIF, $\alpha = 0.73$ for FIW), first six for Work interfering with family, and last five for Family interfering with work (Zhao et al., 2011). Sample questions included "My job keeps me from spending time with my family members" and "My family demands make it hard for me to do my job well".

Emotional Exhaustion. The emotional Exhaustion Scale employed by Watkins and colleagues was utilized in this study to examine the emotional exhaustion in the subjects under the COVID-19 pandemic. It included three simple questions like “I feel emotionally drained from my work” which were required to rate on a seven-point scale (1 = strongly disagree, 7 = strongly agree, $\alpha = 0.88$).

5 Results

The control variables in this study were age, the number of children, and the number of roommates. The descriptive statistics, correlations, and reliability coefficients are displayed in Table 1. Both WIF (work interfering with family) ($r = -0.168, p < 0.05$) and FIW (family interfering with work) ($r = -0.177, p < 0.05$) had a negative relationship with adequate work environment.

And, from Model 2b and 3b in Table 2, the line regressions of WIF ($\beta = -0.234, p < 0.05, R^2 = 0.028, \Delta R^2 = 0.024$) and FIW ($\beta = -0.155, p < 0.05, R^2 = 0.022, \Delta R^2 = 0.020$) with adequate work environment were significant; Hypothesis 1a and 1b were supported, which means that both adequate work environment was negatively related with WIF and FIW.

The result shown in Table 2 Model 1b indicated a statistically significant negative relationship between adequate work environment and emotional exhaustion ($\beta = -0.262, p < 0.05, R^2 = 0.045, \Delta R^2 = 0.028$). Besides, Model 2d in Table 2

Table 1. Descriptive statistics, reliability coefficients, and correlations

Variables	Mean	SD	1	2	3	4	5	6	7	8
1. Age	30.490	5.770								
2. Children	1.910	.561	.397**							
3. No. Roommate	3.290	1.279	-.020	.239**						
4. Work environment	5.262	.986	.051	.144*	.117	.737				
5. Emotional exhaustion	3.304	1.442	-.171	-.104	-.003	-.174*	.875			
6. Gender	.510	.501	.047	-.039*	-.062	-.061	-.041			
7. Work interfering with family conflict (WIF)	3.719	1.334	-.097	-.080	.069	-.168*	.576**	.088	.888	
8. Family interfering with work conflict (FIW)	2.486	.897	-.020	-.039	.081	-.177*	.437**	.003	.402**	.730

Note: * $p < 0.05$. ** $p < 0.01$. Gender was dummy coded (female = 0). Cronbach's Alpha reliability coefficients are reported on the diagonal. $N = 202$.

Table 2. Linear regressions of emotional exhaustion, WIF, and FIW

Variables	Emotional Exhaustion		Work interfering with Family				Family interfering with Work			
	Model 1a β (s.e.)	Model 1b β (s.e.)	Model 2a β (s.e.)	Model 2b β (s.e.)	Model 2c β (s.e.)	Model 2d β (s.e.)	Model 3a β (s.e.)	Model 3b β (s.e.)	Model 3c β (s.e.)	Model 3d β (s.e.)
Constant	3.286 *** (.101)	3.284 *** (.099)	3.711 *** (.094)	3.709 *** (.093)	3.698 *** (.092)	3.712 *** (.077)	2.488 *** (.064)	2.487 *** (.063)	2.486 *** (.063)	2.493 *** (.057)
Controls										
Age	-.236 * (.111)	-.239 * (.110)	-.092 (.104)	-.094 (.103)	-.105 (.102)	.016 (.086)	.018 (.070)	.016 (.069)	.017 (.070)	.082 (.064)
Children	-.043 (.115)	-.005 (.114)	-.095 (.108)	-.060 (.107)	-.056 (.106)	.051 (.088)	-.075 (.072)	-.053 (.072)	-.054 (.073)	-.051 (.066)
No. roommate	.008 (.105)	.029 (.104)	.117 (.098)	.136 (.098)	.110 (.097)	.105 (.081)	-.095 (.066)	-.107 (.066)	-.105 (.067)	-.103 (.060)
Independent variable										
Adequate work environment		-.262 * (.102)		-.234 *** (.095)	-.221 * (.094)	-.087 (.080)		-.155 * (.064)	-.155 * (.065)	-.084 (.059)
Mediator										
Emotional exhaustion						.744 *** (.080)				.398 *** (.059)
Moderators										
Gender					.114 (.093)	.144 (.077)			-.012 (.064)	.004 (.057)
Gender \times Adequate work environment					-.219 * (.094)	-.152 (.079)			-.011 (.064)	.025 (.058)
R^2	.017	.045 *	.004	.028 *	.053 *	.343 ***	.002	.022	.012	.196 ***
ΔR^2		.028 *		.024 *	.025 *	.318 ***		.020	-.010	.184 ***

Note: * $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$. Gender was dummy coded (female = 0). WIF = Work interfering with family conflict. FIW = Family interfering with work conflict.

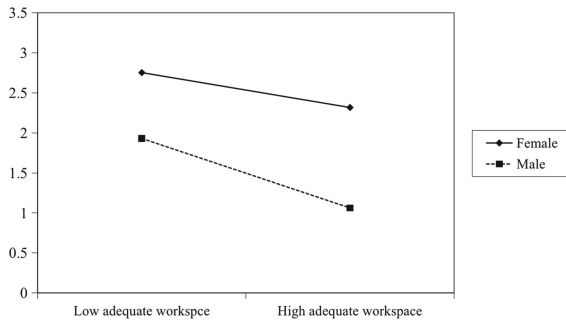


Fig. 2. Work environment and WIF: Gender as the moderator.

showed that, as WIF being dependent variable, the effect of emotional exhaustion was significant ($\beta = 0.744, p < 0.001, R^2 = 0.343, \Delta R^2 = 0.318$) while the effect of work environment was not ($\beta = -0.087, p = 0.278$). There was a full mediation of emotional exhaustion on the relationship between WIF and adequate work environment, and Hypothesis 2a was supported. Model 3d in Table 2 showed that, as FIW being dependent variable, the effect of emotional exhaustion was significant ($\beta = 0.398, p < 0.001, R^2 = 0.196, \Delta R^2 = 0.184$) while the effect of work environment was not ($\beta = -0.084, p = 0.160$). Therefore, emotional exhaustion also had a full mediation impact on the relationship between FIW and adequate work environment, and Hypothesis 2b was supported.

The result in Model 2c in Table 2 indicated a moderating role of gender since the result of the interaction of gender and work environment was significant ($\beta = -0.219, p < 0.05, R^2 = 0.053, \Delta R^2 = 0.025$). Therefore, Hypothesis 3a was verified. We could see from Fig. 2 that males received a stronger influence of adequate work environment compared to females on their perception of work interfering with family conflict. On the other hand, Model 3c in Table 2 suggested that the gender's moderating role on the relationship between work environment and FIW was not significant ($\beta = -0.011, p = 0.866, R^2 = 0.012, \Delta R^2 = -0.010$). Therefore, Hypothesis 3b was not supported.

6 Discussion

In this article, we explored the relationship between adequate work environment and work-family conflicts (both WIF and FIW) including the mediation and moderation of this relationship. Building on Conservation of Resources Theory [11] and using a sample of 202 Chinese workers who worked from home during the COVID-19 pandemic, we found that adequate work environment was negatively related to work-family conflicts, emotional exhaustion had a full mediation role on the relationship, and a stronger influence of adequate work environment perceived by males on WIF compared to females. By uncovering the mediating role of emotional exhaustion and the boundary condition of the effects of the work environment, this study offers theoretical contributions and practical implications for research on the influence of work environment on work-family conflicts during the pandemic.

6.1 Theoretical Contributions

Our study contributes to the literature on the relationship between work environment and work-family conflicts in three ways.

First, it makes a theoretical contribution about the work environment and work-family conflicts to the situation that most of the employees have to work from home under a unique situation that the employees might not be ready for. Since our study is under the COVID-19 pandemic, the setting is quite different from previous studies which have examined the relationship between work environment and work-family conflicts in normal settings. The present study can be useful in preparing for a future emergency similar to the COVID-19 pandemic.

In addition, this study provides the theoretical contribution about the importance of an adequate work environment which cannot be neglected. Based on previous studies, an adequate work environment can increase employee's job satisfaction [8], improve employee's health [10], and reduce emotional exhaustion [14]. While, the present study focuses on emotional exhaustion and work-family conflicts under the condition of COVID-19 when many employees have no choice but to work from home, an environment not originally designed for work.

Finally, the present study makes the theoretical contribution by exploring the mediation and moderation which affect the relationship between work environment and work-family conflicts. Although some previous studies have explored the relationship of emotional exhaustion and work-family conflicts [6] and the impacts of gender on work-family conflicts [4], our study explored these impacts under the COVID-19 pandemic and examined the mediating role of emotional exhaustion and the moderating role of gender.

6.2 Practical Implications

Our findings also have important practical implications. We find that an inadequate work environment can significantly increase emotional exhaustion, which in turn increases work-family conflicts and males are influenced more by the work environment on encountering WIF. We thus suggest that managers could do more research on emotional exhaustion and design work to reduce emotional exhaustion during the COVID-19 pandemic, based on its mediating role. Organizations could provide office supplies like sound insulation boards, zoom access, and internets to improve employees' work environment.

6.3 Limitations and Future Research

This study has several limitations. First, this study might have common method bias which is caused by self-report research design [13]. The subjects in our study might have a consistency motif which "refers to the propensity for respondents to try to maintain consistency in their responses to questions" [13]. In this way, they might just respond that they experienced both high emotional exhaustion and work-family conflicts to keep the consistency. To reduce the impact of common method bias, future research can pay more attention to the sequence and the length of the questions of the survey. Besides, this

study might have a limitation on generalizability. With a small sample of 202 people in China, this study might not be sufficient or suitable to apply to other countries. Taking this into consideration, future research can retest our model in other countries and use a larger sample size. Finally, other mediators or moderators might also exist to influence the study results. For example, job satisfaction might have some influence on the relationship between work environment and work-family conflicts. Therefore, future research can explore more on other potential variables.

7 Conclusion

By examining the influence of an adequate work environment on work-family conflicts during the COVID-19 pandemic, this study found a negative relationship between these two, the mediating role of emotional exhaustion, and a phenomenon that males receive a stronger influence of adequate work environment on WIF compared to females. This study offers important theoretical implications for exploring the work environment and work-family conflicts under special situations that most employees have to work from home.

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