

# Working From Home During COVID-19

## *Does Work-Family Conflict Mediate the Relationship Between Workplace Characteristics, Job Satisfaction, and General Health?*

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**Objective:** The aim of the study is to investigate whether work-family conflict and/or family-work conflict mediated the relationship between workplace characteristics and general health and job satisfaction in a sample of workers working from home in a recommended/mandatory context due to COVID-19 measures. **Methods:** Data were collected via online questionnaire as part of the Employees Working from Home study. Analyses in this article used data collected at 2 time points 6 months apart, including 965 complete responses from the first questionnaire and 451 complete responses from the second questionnaire. **Results:** Relationships between predictor and outcome variables were in the directions expected, and both work-family conflict and family-work conflict mediated these relationships. **Conclusions:** Work-life interaction partly explains the relationship between work characteristics and general health and job satisfaction health in a population undertaking involuntary working from home.

**Keywords:** working from home, work-family conflict, family-work conflict, mediation, work-family interface

The COVID-19 pandemic changed the way we work. After the World Health Organization declaration of a pandemic on March 11, 2020,<sup>1</sup> lockdowns, travel bans, workplace and school closures, and among other measures were introduced to contain the spread of the virus before the development and distribution of effective vaccines.<sup>2</sup> As a result, many workers who could work from home were initially encouraged, and later mandated, to do so.<sup>3</sup>

Several psychosocial mechanisms have been identified through which the mandated work from home measures may affect physical and mental health of employees, for example, via economic effects, social isolation, disrupted family relationships, poorer health-related behaviors,<sup>2,4,5</sup> but evidence about the general health consequences of these dramatic changes remains sparse. The current research aims to address this gap by investigating the role played by work-life interaction, if any, in the relationship between workplace characteristics and general health and job satisfaction in a group of workers engaged in

recommended or mandatory working from home (WFH) during the COVID-19 pandemic.

People have worked from home for centuries.<sup>6</sup> Before the COVID-19 pandemic, WFH was often undertaken on a voluntary basis with work arrangements negotiated by employers and employees,<sup>7</sup> and much of the extant literature before 2020 reflects this, with a focus on outcomes such as family functioning,<sup>8</sup> perceived objective career success,<sup>9</sup> satisfaction with teleworking,<sup>10</sup> and productivity.<sup>11</sup> Allen et al<sup>12</sup> provided an overview of research findings relating to the implications of voluntary/requested telecommuting for both work and non-work outcomes, but little is known about individual employee outcomes associated with recommended or mandated WFH.

The rapid shift to WFH as a result of the pandemic meant workers who rarely or never worked from home were required to do so, irrespective of whether their environment and equipment were appropriate. Many thought that this situation would be for a limited time, perhaps a few weeks, so they may not have invested much effort or priority into establishing a workspace conducive to WFH while reorganizing so many other aspects of their daily life, which were disrupted by the COVID-19-related changes. Oakman et al<sup>13</sup> reported baseline data from a longitudinal study investigating individual outcomes for a group of employees WFH due to COVID-19 public health measures and found 15% of respondents did not have a dedicated workspace at home; for example, they worked from the dining table.

In addition, for many workers, both work and home demands changed (usually increasing<sup>4,14,15</sup>), so it was not simply a case of WFH as it may have been done before the pandemic. The importance of policies and practices to enable employees to better manage their work-life interaction has been recognized previously<sup>16,17</sup>; however, during the pandemic, many organizations rapidly transitioned to WFH, and existing policies and practices may have been inadequate for the unprecedented work situation that arose. Organizations were required to manage and support employees who needed to combine work with nonwork responsibilities at the same time and in colocation (eg, working while supervising home learning and childcare), a situation likely not envisaged when organizations established work-life interaction or WFH policies, and which forced organizations to adapt “on the go.”

While the need for mandatory WFH has changed as vaccination rates increase and businesses begin to operate under a “COVID normal” model, potentially, some WFH will continue because of employee or employer preference,<sup>18</sup> or in response to new variants of the virus.<sup>19</sup> This suggests that evidence about optimal WFH conditions and attendant health effects is urgently needed. A rapid review to identify physical and mental health outcomes associated with WFH found physical health outcomes were less well covered compared with mental health outcomes.<sup>20</sup> The review examined literature published before the COVID-19 pandemic, and only one article was identified that focused on workers undertaking mandatory WFH.

In one of few cross-sectional studies of WFH in mandatory conditions, Oakman et al<sup>13</sup> described more than 70% of respondents as experiencing MSD pain, with women reporting higher levels of pain compared with men. Women also reported higher stress levels

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and more concerns about job security than did men. Men, compared with women, reported increased levels of work-to-family conflict and lower levels of recognition from their employer for their work. Graham et al<sup>21</sup> extended this work by examining the roles of sex and parental responsibilities on individual outcomes. They found that women's increased reporting of MSD pain was independent of the presence of children and women with children experienced more stress than men with children. Children's presence in the household while working increased work-to-family conflict, as did full-time work and working in a location with interruptions. Satisfaction with the division of household tasks seemed protective against increases in work-to-family conflict.

The rapid shift to mandatory/recommended WFH has potential to negatively impact health and well-being through a number of other or similar pathways. For example, the use of inappropriate furniture and equipment can lead to physical discomfort, whereas increased household demands and time pressure can lead to increased feelings of stress. In addition, the boundary between work and home may become blurred, leading to spillover or conflicts between work and home, potentially exacerbated when work "never goes away."

### Spillover Between the Work and Nonwork Domains

Irrespective of WFH, concurrent participation in both work and nonwork domains can result in spillover, where positive or negative emotions or behaviors can spill over from one domain to the other, impacting emotions and behaviors in that domain.<sup>22,23</sup> Spillover is bidirectional; that is, the direction of influence can be from work to nonwork (ie, work-family) or from nonwork to work (ie, family-work<sup>24-26</sup>). An example of negative spillover is work-family conflict (WFC) that arises when the general demands of, time devoted to, and strain caused by the job interfere with family life.<sup>27</sup> High levels of WFC are associated with numerous negative outcomes for individuals, including poor physical and mental health.<sup>22,23,28</sup> An example of spillover in the opposite direction—family-work spillover—is family-work conflict (FWC) that arises when the general demands of, time devoted to, and strain created by the family interfere with performing work-related responsibilities.<sup>27</sup>

Work-family conflict and FWC can be time, strain, and behavior based,<sup>29</sup> for example, when long work hours or preoccupation with one of the roles causes difficulties meeting demands associated with the other role, or when strain, such as anxiety, arising in one role affects performance in the other role. Behavior based conflict is thought to arise where antagonistic behaviors are required between the 2 domains.<sup>29,30</sup> Work-family conflict and FWC may play a key role in explaining the relationship between workplace characteristics and job satisfaction and health outcomes but has not been investigated in a mandated or recommended WFH context, as was the case during the COVID-19 pandemic.

### Work-Family Conflict and FWC as Potential Mediators in the Relationship Between Workplace Characteristics and Employee Outcomes

The importance of workplace characteristics on employee and organizational outcomes has long been recognized. In general, working in good, meaningful employment is better for health and well-being than not working.<sup>31,32</sup> However, some work, for example, physically demanding or dangerous work, or work in a poor psychosocial environment (eg, limited autonomy, high workload, difficult relationships at work<sup>33,34</sup>), can be hazardous to health and well-being.

Previous research has examined the potential role of WFC in mediating the relationship between workplace characteristics and employee outcomes with little, if any, attention paid to the potential role of FWC in employee health or job satisfaction outcomes. Moreover, the prior literature on WFC has not focused on recommended or mandated WFH. For example, WFC has been found to both mediate and moderate the relationship between musculoskeletal pain and work-

place characteristics.<sup>35,36</sup> Weale et al<sup>37</sup> reported that WFC moderated the relationship between workplace characteristics and work ability (the ability to work at one's best<sup>38</sup>). Weale et al<sup>39</sup> found that WFC mediated the relationship between workplace characteristics (relationships with management, poor relationships with colleagues, and safety climate) and job satisfaction; however, these studies did not include people WFH, so it is unknown whether these findings apply in a WFH context, irrespective of whether WFH is undertaken on a recommended/mandatory basis or by negotiation.

More recently, Tran et al<sup>40</sup> found that WFC mediated the relationship between work-family managerial support and affective commitment and job satisfaction. Again, it is unknown whether these findings are applicable in a WFH context. A further limitation of the extant research is that findings are based on cross-sectional data; thus, causal directions cannot be ascertained.

To the authors' knowledge, research exploring potential mediation by WFC and FWC in workers undertaking recommended or mandatory WFH has not previously been conducted. The current research attempts to address this gap by examining the role of both WFC and FWC as potential mediators of the relationship between workplace characteristics and general health and job satisfaction, in a sample of workers in Australia during the COVID-19 pandemic restrictions. Figure 1 shows the pathways examined in the current research.

### Effects of WFC and FWC on Health

Spillover between work and nonwork domains has been associated with negative outcomes for individuals and has potential to impact general health. General health has established links to mortality and a range of adverse health outcomes, for example, chronic disease incidence.<sup>41-43</sup>

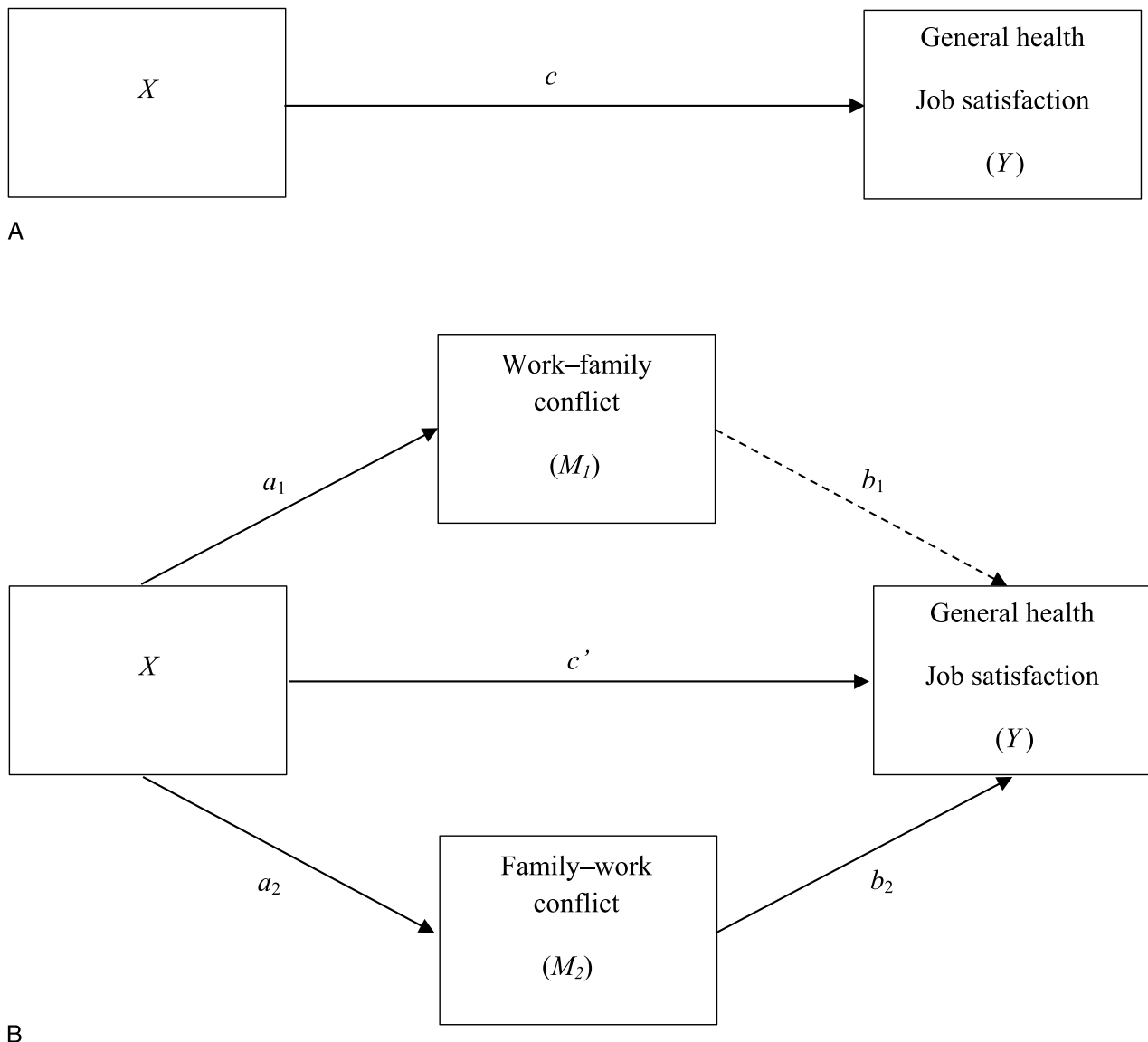
All forms of conflict as a result of attempting to better manage participation in both domains can create feelings of stress and strain, affecting both satisfaction with work-life interaction and health outcomes. High levels of WFC are generally associated with negative health outcomes,<sup>22,44-48</sup> although much of the extant research has used subjective health measures.<sup>46</sup> Other research has noted effects may be gendered and influenced by parental responsibilities,<sup>21,49</sup> whereby women, or those with caring roles, have higher WFC resulting in poorer health.

Employment is a key social determinant of health, as are workplace characteristics<sup>50,51</sup>; however, WFC may impact health via the body's stress response,<sup>52</sup> and poor sleep health<sup>53,54</sup> and/or long hours<sup>47</sup> may impact health behaviors. Family-work conflict has similarly been associated with negative outcomes that could impact health (eg, work distress<sup>55</sup>).

### Workplace Characteristics, Job Satisfaction, and Work-Life Interaction

Employee well-being has been positively associated with productivity,<sup>56-58</sup> and job satisfaction is known to be negatively associated with turnover intentions.<sup>59-61</sup> Thus, examining job satisfaction is important for both organizations and individuals.

Many factors are known to affect job satisfaction; however, no "gold standard" exists to indicate which aspects of work should be taken into consideration when measuring job satisfaction.<sup>62,63</sup> Job satisfaction is known to be influenced by satisfaction with workload, professional support, team spirit, training, and pay, among other factors.<sup>64,65</sup> Lambert et al,<sup>60</sup> in their study of a national sample of workers, reported that the work environment is more important in shaping workers' job satisfaction than are individual characteristics; however, they also found autonomy had an insignificant effect on job satisfaction and suggest that there may be differences between occupations in terms of the degree of autonomy expected. For example, self-determination theory poses that autonomy, including at work, is an integral part of employees' basic needs and that, when fulfilled, contributes to overall work motivation, performance, and job satisfaction.<sup>66</sup>



**FIGURE 1.** Path diagram showing (A) the total effect of the independent variable ( $X$ : quantitative demands, influence, supervisor support, coworker support) on Health and Job satisfaction ( $Y$ ) and (B) the direct effect and causal paths linking  $X$  to  $Y$ .

The job characteristics model developed by Hackman and Oldham<sup>67</sup> is one of the most well-known frameworks of job satisfaction, linking a range of job factors (eg, task variety, autonomy) to job satisfaction. However, such models do not include nonwork-related factors or factors associated with the interaction between work and nonwork. Previous studies have attempted to link the domains by exploring the influence of workplace characteristics on WFC or work-life balance,<sup>47,68,69</sup> and Golden and Veiga<sup>11</sup> reported a curvilinear relationship between job satisfaction and telecommuting. That is, a positive relationship exists at lower levels of telecommuting, but satisfaction plateaus at higher levels of telecommuting.

Previous research has revealed a negative relationship between job satisfaction and both WFC and FWC.<sup>39,70</sup> Mesmer-Magnus and Viswesvaran<sup>71</sup> reported that WFC was less related to job satisfaction than was FWC. Hong et al<sup>72</sup> found that job satisfaction was impacted by both WFC and FWC, indicating that work interruptions due to family demands seem to be a strong instigator of reduced job satisfaction and the importance of considering nonwork-related factors in job satisfaction.

To the authors' knowledge, few studies have explored the potential role of WFC or FWC as a pathway through which workplace characteristics influence broader outcomes such as job satisfaction and general health and none in a recommended or mandatory WFH context. Two notable exceptions are research by Ngah et al<sup>73</sup> and Weale et al.<sup>39</sup> Ngah et al<sup>73</sup> found that WFC explained the relationship between lack of supervisor support and low job satisfaction for single mothers in Malaysia, whereas Weale et al<sup>39</sup> reported that WFC mediated the relationship between a range of workplace characteristics (relationships with management, relationships with colleagues, and safety climate) and job satisfaction. While these findings are interesting and extend knowledge on the potential role of WFC on individual outcomes, neither study was conducted with participants experiencing recommended or mandatory WFH.

Using data, collected from those WFH during the COVID-19 pandemic in Australia, the present study explored whether WFC and FWC play a mediating, or explanatory, role in the relationship between workplace characteristics (quantitative demands, autonomy, supervisor support, and coworker support) and job satisfaction, and general

health for a group of workers undertaking recommended or mandatory WFH in Australia during the COVID-19 pandemic. This study extends previous research on the experience of WFH, which has been primarily based on voluntary or negotiated WFH.

**METHODS**

This article draws on data from the Australian mixed methods Employees Working from Home study, the sampling, and recruitment strategy having been previously detailed.<sup>13</sup> Eligibility criteria to participate in the initial study were: aged 18 years or greater and WFH at least 2 days per week during the period after the declaration of the COVID-19 pandemic in 2020 in Australia. A follow-up was planned for 6 months after the initial study and coincidentally occurred during an additional COVID-19 lockdown in 2021 for most participants. This analysis contains the 965 complete responses from the first questionnaire and 451 complete responses from the second questionnaire. Ethics approval was obtained from La Trobe University’s Human Ethics Research Committee (HEC20388).

**Measures**

Data were collected via an online questionnaire developed using validated instruments with supplementary measures constructed where these were not available. General health was measured by response to the item “In general, would you say your health is:” with respondents selecting an option from poor (1) to excellent (5). Job satisfaction was measured with the item “How pleased are you with your job overall, everything taken into consideration?” with respondents selecting an option from very unsatisfied (1) to very satisfied (5).

Workplace characteristics were measured using items from the Copenhagen Psychosocial Questionnaire.<sup>74</sup> Characteristics measured were quantitative demands (high demands are a workplace stressor), amount of influence over work, supervisor support, and coworker support (high values represent higher workplace resources), rated on a 5-point scale from never/hardly ever (1) to always (5). For supervisor support and coworker support, a “not applicable” option was included. Mediator variables (WFC and FWC) were measured using scales developed by Netemeyer et al,<sup>27</sup> with items rated on a 7-point scale from strongly disagree (1) to strongly agree (7). Average scores across items were used to construct the final measures (example items and measures are shown in Table 1). In cases where respondents selected “not applicable” their score for the final measures was the average of the remaining items.

Age was based on the question “What is your age group?” 18 to 25 years, 26 to 35 years, 36 to 45 years, 46 to 55 years, and 56 years and greater. The categories were then collapsed to 18 to 35 years, 36 to 45 years, 46 to 55 years, 56 years and greater. Sex was based on the question “Are you: male, female, other,” the six persons who identified as “other” were excluded from this analysis. Participants were classified as having dependents at home during work hours (“dependents present”) if they answered “yes” to the question “When you are working at home are children usually at home with you?” at either time point. Work hours were classified according to participants’ answer to the question “Currently what are your usual working hours

(average per week)?” Those answering greater than or equal to 35 hours per week classed as “full time” and those working greater than 0 to less than 35 were classed as “part-time.”

**Data Analysis**

Simple mediation models with WFC and FWC as potential mediators were tested (Fig. 1). The total effect of each predictor and mediator on general health and job satisfaction was modeled using a generalized mixed-effect model with Gaussian link function and random slope ID.<sup>75</sup> This modeling approach used all 1416 observations (965 from the first timepoint and 451 from the second timepoint), providing sufficient power to conduct the mediation analysis, while accounting for the intracorrelation of multiple scores from some respondents. Calculation of direct and indirect effects and proportion of mediation was completed using the R package “mediation.”<sup>76</sup> Analyses to explore mediation by WFC and FWC were conducted independently with general health and job satisfaction (Supplemental Digital Content 1, <http://links.lww.com/JOM/B151>) treated as continuous variables<sup>77</sup> in the main analyses. For completeness, total effects were also calculated with cumulative link mixed models treating the outcomes as ordinal factor variables using the R package “ordinal.”<sup>78</sup> Analysis was carried out in R version 4.1.1 “Kick Things.”<sup>79</sup> Quasi-Bayesian confidence intervals are presented. All models are adjusted for dependents present, sex, age, and work hours.

**RESULTS**

Participant characteristics are shown in Table 2. For a full description of the sample, see the study by Oakman et al.<sup>13</sup>

Overall, workplace characteristics showed highly significant associations with general health and job satisfaction. Increasing quantitative job demands were associated with a reduction in general health and job satisfaction, while increasing influence, supervisor support, or coworker support was associated with an increase in general health and job satisfaction (Table 3; see Supplemental Digital Content 2 for ordinal models, <http://links.lww.com/JOM/B152>).

The effect of predictor variables on WFC and FWC, as per Baron and Kenny’s<sup>80</sup> conditions for mediation, is shown in Table 4.

Work-family conflict significantly mediated the effects of all predictor variables on general health and job satisfaction (Table 5). The extent of the mediation varied: while 76% of the effect of quantitative demands on general health went via WFC, only 16% of the effect of influence on general health went through WFC. Similar results can be seen with job satisfaction, 53% of the effect of quantitative demands on job satisfaction went through WFC, while only 5% of the effect of supervisor support on job satisfaction went through WFC. In all cases, the average causal mediation effect or indirect effect was highly significant.

Similarly, FWC mediated the effects of the predictor variables on general health and job satisfaction (Table 6). However, the proportion of the total effect going through the mediator was lower than the proportions seen with WFC mediation. Only 1.7% of the effect of supervisor support on job satisfaction went through FWC, with the

**TABLE 1.** Measures Included in the Analysis

	No. Items	Example Item	$\alpha^*$	Mean $\pm$ SD
Quantitative demands	4	I do not have time to complete all my work tasks	0.81	2.56 $\pm$ 0.83
Influence	3	I have a large degree of influence on decisions affecting my work	0.86	3.17 $\pm$ 0.92
Supervisor support	2	I can get help and support from my immediate superior, if needed	0.91	4.12 $\pm$ 1.05
Coworker support	2	My colleagues are willing to listen to my problems, if needed	0.89	4.20 $\pm$ 0.88
WFC	5	My job creates stresses that makes it difficult to fulfill family duties	0.95	3.69 $\pm$ 1.66
FWC	5	I have to put off doing things at work because of demands on my time at home.	0.95	2.89 $\pm$ 1.53

\*Spearman-Brown presented for measures with 2 items, Cronbach for measures with >2 items.

**TABLE 2.** Description of the Sample\*

	All (N = 964)	Male (n = 230)	Female (n = 728)
Age			
18–35 y	209 (26.49%)	40 (21.28%)	165 (27.73%)
36–55 y	450 (57.03%)	103 (54.79%)	346 (58.15%)
≥56 y	130 (16.48%)	45 (23.94%)	84 (14.12%)
State			
Victoria	807 (83.71%)	190 (82.61%)	611 (83.93%)
Other	157 (16.29%)	40 (17.39%)	117 (16.07%)
Role			
Manager	157 (16.29%)	47 (20.43%)	109 (14.97%)
Professional	587 (60.89%)	154 (66.96%)	429 (58.93%)
Clerical or administrative workers	198 (20.54%)	21 (9.13%)	176 (24.18%)
Community and personal service worker	10 (1.04%)	1 (0.43%)	9 (1.24%)
Sales worker	9 (0.93%)	4 (1.74%)	5 (0.69%)
Technician, trade, machinery operators, and drivers	3 (0.31%)	3 (1.30%)	0 (0.00%)
Domestic arrangements			
Single person household	123 (12.76%)	24 (10.43%)	99 (13.60%)
Adults only	418 (43.36%)	99 (43.04%)	315 (43.27%)
Dependents	423 (43.88%)	107 (46.52%)	314 (43.13%)
No. children			
None	622 (64.52%)	140 (60.87%)	476 (65.38%)
1	119 (12.34%)	29 (12.61%)	90 (12.36%)
2	181 (18.78%)	50 (21.74%)	131 (17.99%)
≥3	42 (4.36%)	11 (4.78%)	31 (4.26%)
Dependents at home during work hours			
Yes	289 (30%)	85 (37%)	204 (28%)
No	674 (70%)	145 (63%)	523 (72%)
Average hours worked			
Full time	684 (71.62%)	190 (83.70%)	491 (68.01%)
26–34 h	137 (14.35%)	20 (8.81%)	115 (15.93%)
21–25 h	74 (7.75%)	9 (3.96%)	65 (9.00%)
15–20 h	45 (4.71%)	6 (2.64%)	38 (5.26%)
≤14 h	15 (1.57%)	2 (0.88%)	13 (1.80%)
Workstation location			
Work wherever	139 (14.74%)	28 (12.56%)	111 (15.55%)
Separate room	569 (60.34%)	157 (70.40%)	408 (57.14%)
Separate room with interruptions	235 (24.92%)	38 (17.04%)	195 (27.31%)

\*For full description, see the study by Oakman et al.<sup>13</sup>

indirect effect (0.01; 95% confidence interval [CI], 0.00–0.02;  $P = 0.008$ ) being much smaller than the average direct effect (0.44; 95% CI, 0.40–0.49;  $P < 0.001$ ).

## DISCUSSION

This research aimed to explore whether WFC and FWC mediated the relationship between workplace characteristics and general health and job satisfaction for a group of employees who have experienced extended periods of recommended or mandatory WFH due to the COVID-19 pandemic. As expected, workplace characteristics (ie, the amount of work, degree of autonomy, and support from management and coworkers) impacted general health and job satisfaction. Similarly,

perceptions of conflict arising from interference between the work and nonwork domains affected general health and job satisfaction.

Increasing work demands were associated with poorer general health and lower job satisfaction. In addition, the negative impacts of work demands on general health and job satisfaction are partly explained by the effects of work demands on conflicts between work and nonwork domains.

As expected, having influence over workload and feeling supported by management and/or colleagues were associated with better general health and job satisfaction. This finding supports earlier work that showed these specific work characteristics are positively associated with good general health<sup>81–83</sup> and job satisfaction.<sup>39,84</sup> Both good health and job satisfaction are important, given their relationship with

**TABLE 3.** Total Effects of Predictor Variables, WFC, and FWC on the Outcomes of General Health and Job Satisfaction Without Consideration of Potential Mediation

	General Health, B (95% CI)	Job Satisfaction, B (95% CI)
Quantitative demands	−0.15 (−0.21 to −0.08)***	−0.22 (−0.29 to −0.15)***
Influence	0.22 (0.16 to 0.28)***	0.37 (0.31 to 0.43)***
Supervisor support	0.19 (0.07 to 0.17)***	0.45 (0.40 to 0.50)***
Coworker support	0.17 (0.11 to 0.23)***	0.38 (0.32 to 0.44)***
WFC	−0.11 (−0.15 to −0.08)***	−0.13 (−0.17 to −0.10)***
FWC	−0.10 (−0.14 to −0.06)***	−0.09 (−0.13 to −0.05)***

\*\*\* $P < 0.001$ . All models adjusted for dependents present, sex, age, and work hours.

**TABLE 4.** Effect of Predictor Variables on WFC and FWC

	WFC, <i>B</i> (95% CI)	FWC, <i>B</i> (95% CI)
Quantitative demands	1.090 (0.995 to 1.188)	0.625 (0.531 to 0.719)
Influence	-0.390 (-0.491 to -0.290)	-0.136 (-0.227 to -0.046)
Supervisor support	-0.336 (-0.422 to -0.251)	-0.168 (-0.245 to -0.091)
Coworker support	-0.388 (-0.492 to -0.285)	-0.229 (-0.322 to -0.137)

All models adjusted for dependents present, sex, age, and work hours.

various employee/organizational outcomes. For example, poor general health has been associated with increased mortality,<sup>41</sup> chronic disease, physical and cognitive functional limitations, and higher turnover intentions.<sup>43</sup> Job satisfaction has been associated with lower turnover intentions and better organizational performance.<sup>59-61</sup>

The current study also supports earlier research showing that WFC mediates the relationship between workplace support and job satisfaction<sup>39</sup> and extends knowledge by demonstrating the role of FWC as an explanatory pathway between workplace characteristics and job satisfaction. In addition, the present study indicates that these pathways exist for workers undertaking recommended or mandated WFH. The finding that both WFC and FWC partly explain the relationship between workplace characteristics and general health has not been previously established, to the authors' knowledge.

This study demonstrated that both WFC and FWC were particularly important in explaining how high workload (eg, insufficient time available to complete required tasks) affected general health and job satisfaction. The negative effects of high work demands on health and job satisfaction have been recognized previously,<sup>85</sup> and both WFC and FWC have been positively associated with workload.<sup>85</sup> The present study demonstrates that this effect may occur via WFC and FWC for workers WFH on an involuntary basis.

Support from supervisors was also found to be important, particularly for general health. Previous research has shown supervisor support, especially family-supportive supervision, is critical in reducing the conflict workers experience when attempting to better manage their participation in both the work and nonwork domains.<sup>86</sup> Supportive supervision is one way in which organizations can demonstrate an organizational culture that promotes good work-life interaction out-

**TABLE 5.** Mediation by WFC on the Associations Between Predictor Variables and General Health and Job Satisfaction

	General Health	Job Satisfaction
Quantitative demands		
Indirect effects	-0.11 (-0.15 to -0.07)***	-0.11 (-0.16 to -0.07)***
Direct effects	-0.04 (-0.11 to 0.03)	-0.10 (-0.19 to -0.02)*
Proportion via mediator	0.76 (0.43 to 1.30)***	0.53 (0.29 to 0.88)***
Influence		
Indirect effects	0.04 (0.02 to 0.05)***	0.04 (0.02 to 0.05)***
Direct effects	0.18 (0.13 to 0.24)***	0.33 (0.27 to 0.39)***
Proportion via mediator	0.16 (0.10 to 0.25)***	0.10 (0.05 to 0.15)***
Supervisor support		
Indirect effects	0.04 (0.02 to 0.05)***	0.02 (0.01 to 0.04)***
Direct effects	0.08 (0.03 to 0.13)**	0.43 (0.38 to 0.47)***
Proportion via mediator	0.31 (0.18 to 0.59)***	0.05 (0.03 to 0.08)***
Coworker support		
Indirect effects	0.04 (0.02 to 0.06)***	0.04 (0.02 to 0.05)***
Direct effects	0.13 (0.07 to 0.19)***	0.34 (0.28 to 0.40)***
Proportion via mediator	0.23 (0.13 to 0.40)***	0.10 (0.05 to 0.15)***

\**P* < 0.05 \*\**P* < 0.01 \*\*\**P* < 0.001. All models adjusted for dependents present, sex, age, and work hours.

**TABLE 6.** Mediation by FWC on the Associations Between Predictor Variables and General Health and Job Satisfaction

	General Health	Job Satisfaction
Quantitative demands		
Indirect effects	-0.05 (-0.08 to -0.02)***	-0.03 (-0.06 to -0.01)*
Direct effects	-0.109 (-0.17 to -0.03)**	-0.19 (-0.26 to -0.11)***
Proportion via mediator	0.34 (0.16 to 0.72)***	0.14 (0.02 to 0.29)*
Influence		
Indirect effects	0.01 (0.003 to 0.02)***	0.01 (0.002 to 0.02)**
Direct effects	0.21 (0.16 to 0.27)***	0.36 (0.30 to 0.42)***
Proportion via mediator	0.05 (0.02 to 0.11)***	0.03 (0.01 to 0.05)**
Supervisor support		
Indirect effects	0.02 (0.01 to 0.03)***	0.01 (0.001 to 0.02)**
Direct effects	0.10 (0.06 to 0.15)***	0.44 (0.40 to 0.49)***
Proportion via the mediator	0.13 (0.06 to 0.25)***	0.02 (0.003 to 0.04)**
Coworker support		
Indirect effects	0.02 (0.01 to 0.03)***	0.01 (0.003 to 0.03)**
Direct effects	0.15 (0.08 to 0.21)***	0.37 (0.30 to 0.43)***
Proportion via mediator	0.12 (0.05 to 0.24)***	0.03 (0.01 to 0.07)**

\**P* < 0.05 \*\**P* < 0.01 \*\*\**P* < 0.001. All models adjusted for dependents present, sex, age, and work hours.

comes for employees.<sup>87,88</sup> In the present study, support from peers was also identified as a predictor of both general health and job satisfaction, consistent with Chou et al<sup>65</sup> who reported that professional support arising from both management and colleagues is a strong predictor of job satisfaction. Findings from the present study indicate that this relationship is mediated via both WFC and FWC.

Interestingly, in the present study, work-life interaction pathways did not explain as much of the overall effect of autonomy on general health and job satisfaction as it did for other predictors, despite a significant positive relationship between autonomy and both general health and job satisfaction. As noted by Lambert et al,<sup>60</sup> this may be due to differences in expectations of what is considered an appropriate level of autonomy, which is likely to differ between occupations. Similarly, expectations of degree of autonomy may be different for those WFH compared with those working on site. For example, it is feasible that employees may expect greater autonomy when WFH, irrespective of whether this occurs in a mandated or voluntary capacity. Another explanation, drawing on self-determination theory,<sup>66</sup> is that workers who find their work meaningful and fulfilling (because they are supported to, and do, experience autonomy, mastery, and a sense of belonging) are more resistant to strain arising from WFC or FWC.

The findings from this research indicate that WFC explained more of the effects of workplace characteristics on general health and job satisfaction than did FWC. However, the study revealed a significant contribution of FWC to general health and job satisfaction. This finding is interesting in the context of recommended/mandatory WFH as other studies have shown an increase in demands for those with parental responsibilities during the pandemic,<sup>4</sup> thus creating or exacerbating potential for FWC and spillover from home to work. The present study took sex into account and demonstrates the importance of FWC for both men and women.

It is widely accepted that good work-life interaction has positive outcomes for employees.<sup>89</sup> Before the COVID-19 pandemic, negotiated WFH was seen as one means to achieve this and generally associated with positive outcomes.<sup>12</sup> However, choice in flexible working, which includes WFH, is crucial<sup>90</sup> for positive outcomes, but this choice was removed for many workers experiencing mandated or recommended WFH. Recent work has shown that while positive outcomes exist for some workers who work from home due to COVID-19,<sup>91</sup> there can also be negative outcomes.<sup>18,92</sup>

This research raises several implications for organizations. First, it highlights the importance of improving work-life interaction for employees to reduce WFC and FWC specifically in our contemporary WFH context, which is now more widespread and common. Organizations need to consider existing policies and practices regarding WFH, especially in relation to expectations about remote/home-work environments, workloads, and the provision of supervisor support. Working from home is novel for many employees and supervisors/managers, and the latter will need to adapt to modified ways of working. To assist with this, organizations will need to identify skill gaps and potentially upskill supervisors/managers to appropriately manage employees WFH.

A key strength of the current study is the use of a study design with sufficient power to analyze the data to understand the roles of WFC and FWC in mediating the relationships between workplace characteristics and both general health and job satisfaction. A second strength is that these relationships were investigated for the first time in a group of workers experiencing mandatory or recommended WFH, a unique and unprecedented opportunity. This can also be seen as a limitation, as the specific sample limits generalizability to other populations that do not work from home or have experienced mandatory or recommended WFH for different time periods with different restrictions. A further limitation of the research is the restricted number of work characteristics examined. Future work could also explore whether the work location (ie, in a room by oneself or in a location subject to interruptions) was associated with health and satisfaction outcomes and, if so, whether this relationship is mediated by WFC or FWC.

## CONCLUSIONS

This research aimed to investigate whether WFC and/or FWC mediated the relationship between workplace characteristics and general health and job satisfaction for a group of workers experiencing recommended or mandated WFH during the COVID-19 pandemic. The study revealed that relationships were in the directions expected. Both WFC and FWC (to a lesser degree) explained the effects of workload, degree of autonomy or influence, and relationships with supervisors/managers and colleagues on general health and job satisfaction. To the authors' knowledge, this has not previously been demonstrated for those undertaking involuntary WFH. The findings highlight the importance of managing conflict employees may experience when attempting to combine the work and nonwork domains, particularly in the context of mandated/recommended WFH. Implications for organizations include ensuring staff are supported when WFH; for example, by reviewing, and where necessary reducing, workloads, and ensuring adequate policies and practices are in place that recognize the additional demands that come with mandated/recommended WFH.

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