

**“I’m not Working from Home, I’m Living at Work”: Perceived Stress and Work-Related Burnout before  
and during COVID-19**

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### **Abstract**

The purpose of the study was to better understand the relationships among stress, work-related burnout, and remote working brought on by social distancing efforts and stay at home orders put in place during the COVID-19 pandemic. The authors developed a questionnaire incorporating valid and reliable self-report stress and burnout measures (Perceived Stress Scale & Copenhagen Burnout Inventory), demographic, and work-related questions. The questions were used primarily to determine workers' levels of stress before and during the pandemic, to assess potential burnout, and to establish the extent of their previous experience with remote work/telecommuting. The questionnaire was open from March 23<sup>rd</sup> to May 19<sup>th</sup> 2020 and distributed through a survey link on social media and by Qualtrics research services. Results from the analyses suggest that perceived stress did increase during the COVID-19 restrictions, especially for people that had limited experience working from home and were female. Individuals who worked from home before COVID-19 had higher levels of work-related burnout but did not differ based on gender or part-time work status. The results suggest that working from home may create more stress and result in more burnout, which challenges the current moves by some employers to make working from home a permanent arrangement. The authors believe that having research based on valid and reliable instruments will help employers and schools make better decisions about how to support those who can remain at home to avoid the potential for secondary outbreaks.

**Keywords:** Remote Working, Perceived Stress, Work-Related Burnout, COVID-19

While social and traditional media discussed work-related stress and burnout during COVID-19 pandemic, there was little empirical research to examine the phenomena except a few high level surveys (CVS Health, 2020; Center for National Health Statistics, 2020; Petterson, Westfall, & Miller, 2020). As business leaders discussed reopening the economy, there was also a trend towards considering making working from home a more permanent arrangement for some employees (Lavelle, 2020). The purpose of the study was to better understand the relationships among stress, work-related burnout, and forced remote working brought on by social distancing efforts and stay at home orders put in place during the COVID-19 pandemic. The authors developed a questionnaire incorporating valid and reliable self-report stress and burnout measures (Perceived Stress Scale, Copenhagen Burnout Inventory), demographic, and work-related questions. The questions were used primarily to determine people's levels of stress before and during the pandemic, to assess potential burnout, and to establish the extent of previous experience with remote work. The authors believed that having research based on valid and reliable instruments will help employers and schools make better decisions about how to support those who can remain at home to avoid the potential for secondary outbreaks and provide insights on the future in light of the swift global transition to remote working.

### **Literature Review**

#### **The COVID-19 Pandemic Context**

SARS-CoV-2, the virus that causes the COVID-19 disease, began spreading throughout the world in December 2019 and it was officially named by the World Health Organization (WHO) in February 2020 after being first identified in Wuhan, Hubei Province in China (Centers for Disease Control and Prevention, 2020). This disease is characterized by a range of symptoms from mild fever, dry cough, and sore throat to Severe Acute Respiratory Syndrome (SARS), and an increasing list of related conditions like inflammatory illnesses in children (Centers for Disease Control and Prevention, 2020). The virus is easily transmitted from person to person and most individuals who have it may be unaware. By July

2020 the virus had caused more than 10 million infections, over 500,000 deaths globally (Center for Systems Science and Engineering, 2020). At the time of writing, there was neither a vaccine nor proven effective treatment for COVID-19.

On March 11, 2020, the WHO declared COVID-19 a pandemic and in response many countries began recommending social distancing measures, imposing “lockdowns” (i.e. including restrictions on non-essential travel, closing schools and non-essential businesses), and issuing “stay-at-home” orders forced on all people (infected or not) into a sort of quarantine (Centers for Disease Control and Prevention, 2020). The pandemic resulted in the highest number of simultaneous global shutdowns/lockdowns in history. By early April, 2020, the restrictions impacted 3.9 billion people, including 90% of the population of the United States (Secon & Woodward, 2020), and more than 50% of the global population (Sandford, 2020).

As the lockdown restriction measures continued, a theme of concern about mental health began to emerge in the media. Some high-level surveys focused on general levels of stress (CVS Health, 2020), another focused on increased levels of anxiety and depression (Center for National Health Statistics, 2020), and one was concerned about the potential for increased self-harm and suicide based on analyses of unemployment during previous economic downturns (Pettersson, Westfall, & Miller, 2020). Many of the studies taking place during the pandemic had one overarching conclusion – Americans’ mental health was a risk due to “perfect storm” of pandemic anxiety, social isolation due to lockdowns, job loss or fear of job loss, and role stress. One area that many of the studies neglected was the impact that the sudden shift to working remotely and working from home had on individuals who had little or no previous experience with this way of working. Despite this lack of information, corporate leaders were already discussing the possibility of making remote work a permanent fixture for employees (Lavelle, 2020). A popular meme during this time seemed to reflect the mood, it stated, “I’m not working at home, I’m living at work”.

## **Remote Working**

One of the most immediate and significant impacts for most individuals was that those who were able were required to begin working from home. While some essential workers (e.g. healthcare, grocery, postal/delivery, and sanitation) and those whose job required being physically present (e.g. manufacturing, service) were never able to fully move to remote work, many workers were able to transition some or all of their job to their home (Rigotti, De Cuyper, & Sekiguchi, 2020). The seemingly swift transition to working from home during COVID-19 must be viewed in the context of a gradual historical shift, aided by technology, that has allowed many workers to complete significant portions of their work without entering a shared office space (Bell, 2012; Olson, 1983).

Remote working, working from home, and flexible working arrangements have become increasingly more common and sought after over the past 40 years (Chiru, 2017; McAlpine, 2018). The concept of “telecommuting” took hold in the 1970s and 1980s with increased access to personal computers and home networking (Olson, 1983) and expanded over the next 40 years as home computers, internet connectivity, smartphones, and a multitude of internet-based platforms that allow for team collaboration through document sharing and video conferencing have become ubiquitous (Chiru, 2017; Gray & Suri, 2019). During this time individuals and organizations have looked for ways that this flexibility can provide to improve the quality of life for their employees, increase work productivity, and lower overhead costs for organizations (Chiru, 2017; Olson, 1983). While most of the impetus behind remote working has been to allow employees flexibility with their time, improve work-life satisfaction, and reduce some of the overhead costs for organizations (Bell, 2012; Chiru, 2017), research has demonstrated both f benefits and challenges to remote work for individuals and companies. Some benefits include: reduced commute; increased productivity and motivation; less stress from co-workers; allowing for more flexibility to manage family care responsibilities; reduced overhead costs; retaining talented workers; and accessing workers who live too far to commute. Some challenges

include: reduction in the quality of communication among employees and management; difficulties in managing remote workers; reduction in creative idea generation among team members; and the long-term relationship of the employee to the organization (Bell, 2012; Chiru, 2017; Degbey & Einola, 2019; McAlpine, 2018).

Although most jobs have all benefitted from the increasing the flexibility that technology has brought to work (Chiru, 2017; Gray & Suri, 2019), many professional roles still require a high degree of on-site work and work-related travel. The global COVID-19 pandemic forced many organizations and companies who had little experience with significant number of employees working from home to move quickly to develop or expand remote working arrangements for employees who otherwise would not have had this flexibility.

### **Work-Related Stress and Burnout**

The sudden onset of the COVID-19 restrictions enacted across the world meant significant shifts occurred to people's ordinary working and home life (Rigotti, De Cuyper, & Sekiguchi, 2020). The negative impact of chronic workplace stress and resulting burnout on both employees and their organizations is well-documented especially in helping professions, like nursing, psychology, teaching, social work, and even librarianship (Gray & Muramatsu, 2011; Kristensen, Borritz, Villadsen, & Christensen, 2005; Maslach & Jackson, 1984; Maslach & Leiter, 2016; Shirom, Nirel, & Vinokur, 2010; Wood, Guimaraes, Holm, Hayes, & Brooks, 2020).

Previous research into the relationship between remote work and work-life stress provided some insights into potential issues for those who moved quickly to remote work including: role stress and role overload from balancing work and family issues (Bolger, DeLongis, Kessler, & Wethington, 1989; Duxbury, Stevenson, & Higgins, 2018); lack of perceived organizational support (Stamper & Johlke, 2003); impact of the physical environment on job performance (Vischer, 2007); and the impact of subjective experiences of time on work stress (Eldor, et al., 2017). Each of these areas of research build

on and support theories that suggest stress is likely the result of “role overload” (Duxbury, Stevenson, & Higgins, 2018) and “spillover” from home to work and work to home (Bolger, DeLongis, Kessler, & Wethington, 1989), which creates or exacerbates work-family conflicts (Lim & Kim, 2014; Fan, Lam, & Moen, 2019), although some research suggests that work events can have a positive impact on family (Ilies, Keeney, & Goh, 2015). Entrenched gendered expectations around work and family often lead women and lower-class men to be most vulnerable to stress proliferation across work and home life (Fan, Lam, & Moen, 2019). Unsurprisingly, the quantitative, emotional, and mental demands that lead to work stress are consistent with sources of work-related burnout (Peeters, Montgomery, Bakker, & Schaufeli, 2005).

Burnout is a psychological syndrome that is the result of long-term, job-specific, physical and emotional exhaustion from interpersonal stress that results in detachment, cynicism, reduced feelings of efficacy and accomplishment and may have significant impacts on job performance and satisfaction (Kristensen, Borritz, Villadsen, & Christensen, 2005; Maslach & Leiter, 2016). Burnout has been studied extensively in health care and human service occupations, since these tend to require both significant professional skill and high degrees of interaction with people (Gray & Muramatsu, 2011; Kristensen, Borritz, Villadsen, & Christensen, 2005; Maslach & Jackson, 1984; Maslach & Leiter, 2016; Wood, Guimaraes, Holm, Hayes, & Brooks, 2020). Sora and colleagues (2013) suggested that individual feelings of job insecurity can become contagious within an organization, especially one with a strong organizational culture, impede employee interactions and may lead to employee withdrawal, both of which are also symptoms of burnout.

An important element in both stress and burnout in work-home stress and burnout research is gender (Bolger, DeLongis, Kessler, & Wethington, 1989; Duxbury, Stevenson, & Higgins, 2018; Fan, Lam, & Moen, 2019; Karkoulis, Srour, & Sinan, 2016). Pre-pandemic studies consistently showed higher stress and burnout levels for women due to role overload (Bolger, DeLongis, Kessler, & Wethington,

1989; Duxbury, Stevenson, & Higgins, 2018), lack of support from work and spouses/partners (Peeters, Montgomery, Bakker, & Schaufeli, 2005), and more work-family conflicts (Karkoulian, Srouf, & Sinan, 2016) especially for women in precarious (part-time) jobs and from lower socio-economic classes (Fan, Lam, & Moen, 2019; Flesia, Fietta, Colicino, Segatto, & Monaro, 2020). A survey conducted by LeanIn.org and Survey Monkey in early April 2020 found that women being disproportionately impacted by work-family stress during the COVID-19 restrictions in ways that were consistent with the extant research and other emerging COVID-19 findings (Flesia, et al., 2020). For example, women were more likely than men to be experiencing symptoms of stress and burnout, women working full time with a partner and children reported doing 20 more hours a week of housework and caregiving for children and relatives on average than men, with women of color and single mothers reporting higher levels (LeanIn.org and Survey Monkey, 2020). The research also demonstrated limited support from workplaces with people working from home reporting that only 52 percent of their employers had changed policies to allow more flexibility and 34 percent of managers having made any accommodations.

### **Present Study**

#### **Research Questions and Hypotheses**

What emerged from the literature was a complex picture of pre-existing stress and burnout risks in working from home due to the decreased ability to compartmentalize the roles salient to work and home domains, especially for women and those in part-time work. The COVID-19 restrictions created an additional source of stress and burnout and forced more professionals into remote working. Thus, the crisis provided a natural social experiment to better understand issues related to stress, burnout, and technology-facilitated working from home.

The overall research question was: “How have the COVID-19 restrictions impacted perceived stress and work-related burnout for people who are now working from home?” The hypotheses were:



H1: The overall Perceived Stress Scale (PSS) scores will be higher for all participants in the sample since COVID-19 restrictions began.

H2: Overall PSS and Total Work-Related Burnout (TWRB) scores will be higher for those who have jobs that do not typically provide opportunities to work from home.

H3: The COVID-19 work from home restrictions will have a more significant impact on females than males Perceived Stress Scale (PSS) and Total Work-Related Burnout (TWRB) scores.

H4: Part-time workers – those who work less than 30 hours per week – will have higher overall PSS and TWRB scores than full-time workers.

### **Methodology and Sample**

In order to assess the prevalence of stress and burnout among individuals who were working from home due to the COVID-19 restrictions, the authors administered a cross-sectional web-based Qualtrics questionnaire and distributed it via social media (LinkedIn, Twitter), and utilized Qualtrics Research Services to recruit additional participants. The survey was launched on March 24<sup>th</sup> and closed on May 19<sup>th</sup> 2020. To participate in the study, participants had to be 18 years of age and older and currently working from home due to the COVID-19 restrictions. Responses were monitored to help control the number of people in the sample whose job required them to work from home before COVID-19 and to ensure gender representation. A total of 370 questionnaires were started and 326 were completed. Some respondents' answers may not be reflected in some analyses because they did not complete certain sections of the questionnaire. The analyses were carried out by various members of the research team using SAS, R, and SPSS. All statistics for which significance were relevant, the p-value was set at .05. The questionnaire included four demographic and seven work-related questions (see Tables 1 and 2 and Figure 1) designed to better understand the participants. The full questionnaire is available upon request.

INSERT TABLE 1 HERE

The sample was relatively balanced among three age groups (18-34, 35-54, and 55-older) and reflectively of the general population in terms of gender identity. The group was well-educated with over 40 percent of the sample having a graduate degree or higher. Most of the sample self-identified as either a manager/supervisor (32%), Educator (13%), Professional (12%), or other (17%). In the other category, “Manager”, “teacher” and “director” were the most frequent responses.

INSERT FIGURE 1 HERE

Forty per cent of the participants (n = 133) worked exclusively remotely prior to the pandemic (see Table 2). Sixty percent (n =193) of the participants who had non-remote job and 60 percent of those individuals (n = 110) did not have the flexibility to work remotely prior to the pandemic. Prior to the pandemic 65 percent (n = 140) of the group who had flexibility to work from home prior to the pandemic did so for less than 15 hours per week.

INSERT TABLE 2 HERE

## **Instruments**

### ***Stress Inventory***

The Perceived Stress Scale (PSS) is one of the most widely used, valid, and reliable stress measures (Cohen, Kamarck, & Mermelstein, 1983; Cohen & Williamson, 1988; Lee, 2012; Taylor, 2015). Although originally developed nearly 30 years ago, it remains a popular choice for researchers and practitioners to understand how different situations affect perceived stress to both internal and external events. The questions in the scale focus on feelings and thoughts during the last month and ask respondents to indicate how often they felt or thought a certain way. Each question in the PSS is scored 0-4 and all items are totaled to provide a total PSS scores ranging from 0-40. The 10-item version has been found to be as valid and reliable as versions with more items (Lee, 2012; Taylor, 2015).

Because the researchers were interested in changes to stress levels as a result of the restrictions, the 10-item PSS was slightly modified in order to be repeated in the questionnaire. The first

asked about participants feelings and thoughts “during the last month before the COVID-19 restrictions” (pre-COVID) and then the 10 questions were repeated again asking participants to answer about their thoughts and feelings “since the COVID-19 restrictions began” (during-COVID). The Chronbach’s alpha for the 7-item PSS scale for pre-COVID-19 in this study was 0.74 ( $n = 332$ ) and for during COVID-19 the PSS scale was 0.76 ( $n = 332$ ). This is in line with other studies using the 10 question scale (Cohen & Williamson, 1988; Lee, 2012; Taylor, 2015).

### ***Burnout Inventory***

Although burnout in professions was traditionally measured using the Maslach Burnout Inventory (MBI) (Maslach & Jackson, 1984), the applicability of the MBI to some professions has been questioned since it was designed to measure burnout in and validated on human services and helping professionals (Kristensen, Borritz, Villadsen, & Christensen, 2005). Kristensen and colleagues (2005) developed the Copenhagen Burnout Inventory (CBI) in order to provide a conceptually more consistent and statistically more valid and reliable measure of burnout that could be applied to a broader range of professions. Analyses of the CBI have demonstrated it to be a highly validated instrument with applications to a wide-range of professions (Ilić, Arandjelović, Jovanović, & Nešić, 2017; Kristensen, et al., 2005; Sestili, et al., 2018; Wood, Guimaraes, Holm, Hayes, & Brooks, 2020). The CBI breaks the concept of burnout down into 3 components: personal burnout (6 questions); work-related burnout (7 questions); and client-related burnout (6 questions). All questions had 5 possible answers and each of the answer was assigned a certain number of points: 0, 25, 50, 75 and 100. The value of the burnout level was calculated as mean value; therefore, every scale has value 0–100.

This questionnaire used only the 7 question “work-related burnout” subscale of the CBI. Work-related burnout refers to symptoms of exhaustion which are perceived as related to the person’s work, while patient related burnout involves exhaustion which is perceived as related to the person’s work with patients (Ilić, et al., 2017; Kristensen, et al., 2005). The mean value of the scale indicates the

presence of burnout as low if it amounts to fewer than 50 points ( $< 50$ ) and as high if it is above 50 points ( $> 50$ ). Consistent with similar studies, the authors calculated a “total work-related burnout score” (TWRBS), which is reported as the average of the scores on the items ( $n = 326$ ,  $\bar{x} = 47.90$ ,  $sd = 23.06$ ) was calculated and used to test hypotheses. The Chronbach’s alpha for the 7-item work-related subscale in this study was 0.85 ( $n = 326$ ), which was similar to results from two other studies that used the inventory on professional groups, including Kristensen et al. (2005) of 0.87 ( $n = 1910$ ) and the Sestili et al. (2018) study of .868 ( $n = 91$ ). This result demonstrated that the sub scale had an acceptable measure of reliability.

### Results

Hypothesis 1 stated, “The overall Perceived Stress Scores (PSS) will be higher for all participants in the sample since COVID-19 restrictions began.” The total “pre-COVID” PSS ( $n = 326$ ,  $M = 16.27$ ,  $min = 0$ ,  $max = 34$ ) and “post-COVID” PSS ( $n = 326$ ,  $M = 19.63$ ,  $min = 0$ ,  $max = 37$ ) scores were calculated and used to test hypotheses. A two-sample t-test confirmed that there was a statistically significant difference in overall PSS for the pre-COVID and post-COVID scales ( $t = 9.50$ ,  $SD = 5.99$ ,  $p < .0001$ ). This hypothesis was supported by the analyses.

Hypothesis 2 stated, “Overall PSS and Total Work-Related Burnout (TWRB) scores will be higher for those who have jobs that do not typically provide opportunities to work from home.” The analyses for this hypothesis took several steps. First, in looking at those whose job provided them flexibility to work from home before the COVID-19 restrictions had higher overall pre-COVID PSS scores ( $n = 133$ ,  $M = 18.84$ ,  $SD = 5.48$ ) than those who did not ( $n = 199$ ,  $M = 14.55$ ,  $SD = 6.26$ ). A two-sample t-test confirmed that this difference for pre-COVID PSS was statistically significant ( $t(307) = -6.61$ ,  $p < .0001$ ). Similar results were found for post-COVID PSS scores for those who could work from home ( $n = 125$ ,  $M = 21.45$ ,  $SD = 4.46$ ) than those who could not ( $n = 175$ ,  $M = 18.13$ ,  $SD = 7.55$ ) and a two-sample t-test confirmed that the difference was statistically significant ( $t(288) = -4.48$ ,  $p < .0001$ ). Comparing the two scores with

one another, average change for people who did not work from home was higher ( $n = 175$ ,  $M = 3.91$ ,  $SD = 6.35$ ) than for those who did work from home ( $n = 125$ ,  $M = 2.41$ ,  $SD = 5.33$ ) and that difference was statistically significant ( $t(290) = 2.23$ ,  $p = .03$ ). This means that all participants on average experienced more perceived stress; however, the change was greater for those who did not work from home before COVID-19. Concerning TWRB scores and flexibility to work from home, individuals whose jobs did not allow flexibility to work from home before COVID-19 had lower TWRB scores ( $n = 193$ ,  $M = 41.02$ ,  $SD = 21.57$ ) than individuals who previously had flexibility to work from home ( $n = 133$ ,  $M = 57.87$ ,  $SD = 21.52$ ) before the pandemic and these differences were significant ( $t(284) = -16.84$ ,  $p < .0001$ ), although not in the expected direction. In this case, the hypothesis was rejected since TWRB scores were higher for individuals who had flexibility to work from home before the COVID-19 pandemic.

Hypothesis 3 stated, "COVID-19 will have a more significant impact on females than males Perceived Stress Scale (PSS) and Total Work-Related Burnout (TWRB) scores." In relation to stress and gender, females had lower overall pre-COVID PSS scores ( $n = 170$ ,  $M = 15.01$ ,  $SD = 5.87$ ) than males ( $n = 153$ ,  $M = 17.46$ ,  $SD = 6.56$ ). A two-sample t-test confirmed that this gender difference for pre-COVID PSS was statistically significant ( $t(306) = -3.53$ ,  $p = .0005$ ), although not in the expected direction. Similar results were found for during-COVID PSS scores with females ( $n = 156$ ,  $M = 19.16$ ,  $SD = 6.58$ ) having lower average PSS scores than males ( $n = 141$ ,  $M = 20.19$ ,  $SD = 6.69$ ) and a two-sample t-test found it to be statistically significant ( $t(289) = -4.13$ ,  $p < .0001$ ) for during COVID-19 PSS based on gender. In comparing the pre- and during COVID-19 scores, average change for females was higher ( $n = 156$ ,  $M = 4.20$ ,  $SD = 6.03$ ) than for males ( $n = 141$ ,  $M = 2.41$ ,  $SD = 5.79$ ) and that difference was statistically significant ( $t(294) = 2.59$ ,  $p = .01$ ). This result means that although males still have overall higher PSS scores, COVID-19 had a greater impact on female participants in the sample. Concerning burnout and gender, women had lower TWRB scores ( $n = 170$ ,  $M = 43.30$ ,  $SD = 20.76$ ) than men ( $n = 153$ ,  $M = 53.03$ ,  $SD = 24.63$ ) and these differences were significant ( $t(299) = -3.82$ ,  $p < .0002$ ), although not in the

direction hypothesized. The portion of the hypothesis related to PSS scores was accepted and the part of the hypothesis was rejected since women had a more significant change in PSS scores but men had higher TWRB scores than women.

Hypothesis 4 stated, “Part-time workers – those who work less than 30 hours per week – will have higher overall PSS and TWRB scores than full-time workers.” In order to test this hypothesis, it was necessary to recode the original five categories for “number of hours worked for pay” (less than 20; 21-30; 31-40; 41-50; More than 50) into two categories (Less than 30; More than 30). Individuals who were part-time had slightly higher overall pre-COVID PSS scores ( $n = 52$ ,  $M = 16.88$ ,  $SD = 65.23$ ) than those who were full-time ( $n = 280$ ,  $M = 16.15$ ,  $SD = 6.23$ ), but this difference was not statistically significant ( $t(68) = -0.73$ ,  $p = .47$ ). The results were reversed for post-COVID PSS scores with part-time workers having lower PSS scores ( $n = 48$ ,  $M = 18.83$ ,  $SD = 5.47$ ) than those who were full-time ( $n = 252$ ,  $M = 19.78$ ,  $SD = 6.81$ ); however, a two-sample t-test did not find the difference between these two groups statistically significant ( $t(78) = 1.06$ ,  $p = .29$ ). Comparing the pre-and during-COVID scores, the average PSS score change for workers who were full-time was greater ( $n = 252$ ,  $M = 3.43$ ,  $SD = 6.06$ ) than for those who were part-time ( $n = 48$ ,  $M = 2.52$ ,  $SD = 5.57$ ), but that difference was not statistically significant ( $t(70) = 1.02$ ,  $p = .30$ ). These results demonstrate that COVID-19 restrictions have likely had a greater impact on the perceived stress levels of full-time workers than part-time workers; however, the changes were not large enough to be statistically significant.

Concerning burnout and part-time work, those individuals who were part-time as defined by working less than 30 hours ( $n = 51$ ,  $M = 47.27$ ,  $SD = 24.50$ ) had lower overall TWRB scores than those who were full-time ( $n = 275$ ,  $M = 48.01$ ,  $SD = 22.83$ ); however, these differences were not statistically significant ( $t(67) = 0.20$ ,  $p = .84$ ).

INSERT TABLE 3 HERE

The researchers conducted an additional ANOVA analysis utilizing the original five categories for “number of hours worked for pay” (less than 20; 21-30; 31-40; 41-50; More than 50) and this did find a statistically significant differences ( $F(4) = 5.24, p = .0004$ ) but not in the expected directions and some interesting trends emerged among the groups. Of special note (See Table 3), groups who worked “less than 20” hours ( $n = 23, M = 42.39, SD = 20.63$ ) had the lowest TWRB scores and those who worked “More than 50” hours had the highest TWRB scores ( $n = 26, M = 66.76, SD = 21.96$ ). This hypothesis was rejected since neither part could be supported and it appeared that the inverse was more likely to be accurate.

### ***Challenges of working from home***

In order to get a better understanding of the issues that may be contributing to the stress and burnout levels of workers, the survey also offered participants an opportunity to provide more detail about the parts of working remotely that were most challenging during COVID-19 (see Table 4). A question asked participants to “select all that apply” from a list of issues that emerged from the literature.

INSERT TABLE 4 HERE

“Maintaining appropriate levels of communication with my team/colleagues” (21.36%), “Managing technology/communication tools” (19.20%), and “Managing my time/Avoiding distractions” (18.42%) were the most frequently selected from the list. It was noteworthy that only 15 percent of the participants chose “Balancing personal/family responsibilities with workload” since the literature suggested that this would be a likely challenge and thus as source of stress and burnout. These choices suggest that work-related issues were slightly more challenging than family-related issues for these participants.

### Discussion

These results provided some important insights related to perceived stress, work-related burnout, and the challenges of working from home during the first few months of COVID-19 pandemic restrictions in 2020. In this sample of primarily well-educated professionals, the researchers found that males, full-time employees, and individuals who worked from home before the COVID-19 restrictions had higher levels of perceived stress and work-related burnout before the pandemic. During the pandemic, average perceived stress increased for all participants, but significantly increased for workers who did not have the flexibility to work from home before the pandemic and females. While we did not have a measure of work-related burnout pre-pandemic, total work-related burnout (TWRB) scores were an issue for workers who had flexibility to work from home before the pandemic compared to those who did not, men had higher total work-related burnout (TWRB) scores than women, but there were no differences between full-time and part-time workers. The most significant challenges that faced these professionals were primarily related to communication and collaboration with work colleagues via technology and time management, rather than work-family balancing. These findings seem to support the popular crossing social media during the pandemic “I’m not working from home, I’m living at work”.

The unique nature of methodology used in study and the COVID-19 situation raises some important questions and contribute to the validation of the Perceived Stress Scale (PSS) and Copenhagen Burnout Inventory (CBI). Because the researchers were interested in changes to stress levels as a result of the restrictions, the 10-item PSS was slightly modified in order to be repeated in the questionnaire. Given the nature of the pandemic, it would have been difficult to collect true “pre-test” PSS or CBI data, thus the researchers provided a “pre-” and “during” option for the PSS that allowed participants to reflect on stress in two time frames. The retrospective, post-then-pre style approach has been used to program evaluation to minimize response shift bias (Rockwell & Kohn, 1989) (Pratt, McGuigan, & Katzev, 2000) and consistently provides similar results to traditional pre-post-test (Hill &



Betz, 2005). Although it had not been used with the PSS in previous studies, the researchers believed this was the most appropriate method. It is possible that they over or underestimated their stress levels beforehand and, on reflection, the researchers should have also repeated the total work-related burnout (TWRB) scale of the Copenhagen Burnout Inventory (CBI) for comparison. In addition, although the survey opened in March, the majority of the useable responses were not recorded until early May, when the restrictions had been in place for nearly 2 months in many places. This means that the respondents likely had a reliable sense of the impact of the restrictions, but may have had more difficulty accurately appraising their pre-pandemic stress levels. In either case, this was the first instance that the authors could find of the Perceived Stress Scale (PSS) being used in a modified post then pre-test/repeated measure format and fortunately it maintained a high internal consistency. The work-related burnout subscale of the Copenhagen Burnout Inventory (CBI) also maintained a high internal consistency. This finding is noteworthy since this measure was used on a more heterogeneous group of professionals than in most previous studies, which tended to focus on single groups of professionals.

Despite some limitations, the results of this research contribute to the literatures on working from home, work-life stress and work-related burnout among professionals and the validation of both the PSS and CBI. The results build on and support theories that suggest stress is likely the result of “spillover” and “role overload”, which in this context are taking place in the same environment (Bolger, DeLongis, Kessler, & Wethington, 1989; Duxbury, Stevenson, & Higgins, 2018). While the survey did not specifically ask questions about work-family conflicts, previous and current research suggests that these may be increasing during the COVID-19 enforced work from home period especially for women (Fan, Lam, & Moen, 2019; Flesia, et al., 2020; Lim & Kim, 2014; LeanIn.org and Survey Monkey, 2020).

The research also suggested that potential there are potential personal mental health, time, and communication management for teams who are primarily interacting through technology that are worth considering before companies rush to move their employees remotely. The finding that working from

home, pre-pandemic or as the result of pandemic, resulted in higher stress and burnout scores is slightly inconsistent with some received wisdom that has touted the benefits of remote and flexible work. While some of the results in this study may be accounted for by the restrictions and context, the results were consistent with emerging studies on technology-facilitated and “ghost work” (Gray & Suri, 2019; Rosenblat, 2018) that suggest that remote work has a unique (and potentially more potent) set of associated stress and burnout factors. The authors suggest that more research is needed to establish if there are baseline differences in the stress and burnout levels among at-home, flexible, and office-based workers.

These considerations are especially important for organizations in relation to women, salaried employees working long hours, or other contextual factors that may make work-life balance precarious (LeanIn.org and Survey Monkey, 2020). In the context of COVID-19, companies would do well to consider this research in the context of the cautionary tales from the literature on “Uberization” (Rosenblat, 2018), “ghost work” (Gray & Suri, 2019), and McDonaldization (Ritzer, 2018) especially for those considering moving significant numbers of employees to working remotely on a more permanent basis.

### References

- Bell, B. S. (2012). Remote work: Examining current trends and organisational practices. *International HR Adviser*, 49, 4-6.
- Bolger, N., DeLongis, A., Kessler, R. C., & Wethington, E. (1989). The contagion of stress across multiple roles. *Journal of Marriage and the Family*, 51(1), 175-183. <https://doi.org/10.2307/352378>
- Center for National Health Statistics. (2020, June). *Mental Health: Household Pulse Survey*. Retrieved June 17, 2020, from cdc.gov: <https://www.cdc.gov/nchs/covid19/pulse/mental-health.htm>
- Center for Systems Science and Engineering. (2020). *COVID-19 Dashboard*. (C. f. (CSSE), Producer, & John's Hopkins University) Retrieved July 2020, from World Map: <https://coronavirus.jhu.edu/map.html>
- Center for Systems Science and Engineering. (2020). *COVID-19 Dashboard*. (C. f. (CSSE), Producer, & John's Hopkins University) Retrieved June 2020, from World Map: <https://coronavirus.jhu.edu/map.html>
- Centers for Disease Control and Prevention. (2020). *Frequently Asked Questions - Coronavirus Disease 2019 (COVID-19)*. Retrieved May 18, 2020, from cdc.gov: <https://www.cdc.gov/coronavirus/2019-ncov/faq.html>
- Centers for Disease Control and Prevention. (2020). *Social Distancing*. Retrieved May 2020, from cdc.gov: <https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/social-distancing.html>
- Centers for Disease Control and Prevention. (2020). *Symptoms of Coronavirus - Coronavirus Disease 2019 (COVID-19)*. Retrieved 2020 May, from cdc.gov: <https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html>

- Chiru, C. (2017). Teleworking: Evolution and trends in the USA, EU and Romania. *Economics, Management and Financial Markets*, 12(2), 222-229.  
<https://search.proquest.com/docview/1918794152?accountid=11824>
- Cohen, S., & Williamson, G. (1988). Perceived Stress in a Probability Sample of the United States. In S. Spacapan, & S. Oskamp, *The Social Psychology of Health*. Newbury Park, CA: Sage.
- Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior*, 24, 386-396. <https://doi.org/10.2307/2136404>
- CVS Health. (2020, June 16). *Most adults are experiencing more stress than same time last year, new report shows*. Retrieved June 17, 2020, from [cvshealth.com](https://cvshealth.com):  
<https://cvshealth.com/newsroom/articles/most-adults-are-experiencing-more-stress-same-time-last-year-new-report-shows>
- Degbey, W., & Einola, K. (2019). Resilience in virtual teams: Developing the capacity to bounce back. *Applied Psychology: An International Review*, Advance online publication,  
<https://doi.org/10.1111/apps.12220>.
- Duxbury, L., Stevenson, M., & Higgins, C. (2018). Too much to do, too little time: Role overload and stress in a multi-role environment. *International Journal of Stress Management*, 25(3), 250.  
<https://doi.org/10.1037/str0000062>
- Eldor, L., Fried, Y., Westman, M., Levi, A. S., Shipp, A. J., & Slowik, L. H. (2017). The experience of work stress and the context of time: Analyzing the role of subjective time. *Organizational Psychology Review*, 7(3), 227-249. <https://doi.org/10.1177/2041386617697506>
- Fan, W., Lam, J., & Moen, P. (2019). Stress Proliferation? Precarity and Work–Family Conflict at the Intersection of Gender and Household Income. *Journal of Family Issues*, 40(18), 2751-2773.  
<https://doi.org/10.1177/0192513X19862847>

- Flesia, L., Fietta, V., Colicino, E., Segatto, B., & Monaro, M. (2020, May 5). *Stable psychological traits predict perceived stress related to the COVID-19 outbreak*. Retrieved from <https://psyarxiv.com/yb2h8/download/?format=pdf>
- Gray, J. A., & Muramatsu, N. (2011). Work Stress, Burnout, and Social and Personal Resources among Direct Care Workers. *Research in developmental disabilities, 32*, 1065-74.  
<https://doi.org/10.1016/j.ridd.2011.01.025>
- Hill, L. G., & Betz, D. L. (2005). Revisiting the retrospective pretest. *American Journal of Evaluation, 26*(4), 501-517. <https://doi.org/10.1177/1098214005281356>.
- Gray, M. L., & Suri, S. (2019). *Ghost Work: How to Stop Silicon Valley from Building a New Global Underclass*. Houghton Mifflin Harcourt.
- Ilić, I. M., Arandjelović, M. Ž., Jovanović, J. M., & Nešić, M. M. (2017). Relationships of work-related psychosocial risks, stress, individual factors and burnout—Questionnaire survey among emergency physicians and nurses. *Medycyna Pracy, 68*(2), 167-168.  
<https://doi.org/10.13075/mp.5893.00516>
- Ilies, R., Keeney, J., & Goh, Z. (2015). Capitalising on positive work events by sharing them at home. *Applied Psychology: An International Review, 64*(3), 578–598.  
<https://doi.org/10.1111/apps.12022>
- Karkouliau, S., Srour, J., & Sinan, T. (2016). A gender perspective on work-life balance, perceived stress, and locus of control. *Journal of Business Research, 69*(11), 4918-4923.  
<https://doi.org/10.1016/j.jbusres.2016.04.053>
- Kristensen, T., Borritz, M., Villadsen, E., & Christensen, K. (2005). The Copenhagen Burnout Inventory: A new tool for the assessment of burnout. *Work & Stress, 19*(3), 192-207.  
<https://doi.org/10.1080/02678370500297720>

Lavelle, J. (2020, April 3). *Gartner CFO Survey Reveals 74% Intend to Shift Some Employees to Remote Work Permanently*. Retrieved July 2020, from gartner.com:

<https://www.gartner.com/en/newsroom/press-releases/2020-04-03-gartner-cfo-survey-reveals-74-percent-of-orgs-to-shift-some-employees-to-remote-work-permanently>

LeanIn.org and Survey Monkey. (2020, May 7). *Women are maxing out - and burning out - during COVID-19*. Retrieved June 1, 2020, from leanin.org:

[https://media.sgff.io/sgff\\_r1eHetbDYb/2020-05-07/1588873077242/women-are-maxing-out-during-covid-19\\_1.pdf](https://media.sgff.io/sgff_r1eHetbDYb/2020-05-07/1588873077242/women-are-maxing-out-during-covid-19_1.pdf)

Lee, E. H. (2012). Review of the psychometric evidence of the perceived stress scale. *Asian nursing research*, 6(4), 121-127. <https://doi.org/10.1016/j.anr.2012.08.004>

Lim, V., & Kim, T. (2014). The long arm of the job: Parents' work-family conflict and youths' work centrality. *Applied Psychology: An International Review*, 63(1), 151-167. <https://doi.org/10.1111/j.1464-0597.2012.00527.x>

Maslach, C., & Jackson, S. E. (1984). Burnout in organizational settings. *Applied Social Psychology Annual*, 5, 133-153.

Maslach, C., & Leiter, M. P. (2016). Understanding the burnout experience: Recent research and its implications for psychiatry. *World psychiatry: Official journal of the World Psychiatric Association (WPA)*, 15(2), 103-111. <https://doi.org/10.1002/wps.20311>

McAlpine, K. (2018, October). *Don't abandon the water cooler yet: Flexible work arrangements and the unique effect of face-to-face informal communication on Idea generation and innovation*.

Retrieved May 2020, from CAHRS ResearchLink No. 2:

[https://digitalcommons.ilr.cornell.edu/cahrs\\_researchlink/43/](https://digitalcommons.ilr.cornell.edu/cahrs_researchlink/43/)

Olson, M. H. (1983). *Overview of work-at-home trends in the United States*. Retrieved May 2020, from <https://archive.nyu.edu/bitstream/2451/14587/1/IS-83-87.pdf>

- Olson, M. H. (1983). Remote office work: changing work patterns in space and time. *Communications of the ACM*, 26(3), 182-187. <https://doi.org/10.1145/358061.358068>
- Peeters, M. C., Montgomery, A. J., Bakker, A. B., & Schaufeli, W. B. (2005). Balancing work and home: how job and home demands are related to burnout. *International Journal of Stress Management*, 12(1), 43-61. <https://doi.org/10.1037/1072-5245.12.1.43>
- Petterson, S., Westfall, J., & Miller, B. (2020, May 8). *Projected Deaths of Despair During the Coronavirus Recession*. Retrieved June 17, 2020, from WellBeing Trust: [https://wellbeingtrust.org/wp-content/uploads/2020/05/WBT\\_Deaths-of-Despair\\_COVID-19-FINAL-FINAL.pdf](https://wellbeingtrust.org/wp-content/uploads/2020/05/WBT_Deaths-of-Despair_COVID-19-FINAL-FINAL.pdf)
- Pratt, C. C., McGuigan, W. M., & Katzev, A. R. (2000). Measuring program outcomes: Using retrospective pretest methodology. *American Journal of Evaluation*, 21(3), 341-349. <https://doi.org/10.1177/109821400002100305>.
- Rigotti, T., De Cuyper, N., & Sekiguchi, T. (2020). The Corona Crisis: What Can We Learn from Earlier Studies in Applied Psychology? *Applied Psychology: An International Review*, 69(3), 1-6. <https://doi.org/10.1111/apps.12265>
- Ritzer, G. (2018). *The McDonaldization of society: Into the digital age*. Sage Publications.
- Rockwell, S. K., & Kohn, H. (1989). Post-then-pre evaluation. *Journal of Extension*, 27(2), 19-21.
- Rosenblat, A. (2018). *Uberland: how algorithms are rewriting the rules of work*. Univ of California Press.
- Sandford, A. (2020, April 3). *Coronavirus: Half of humanity now on lockdown as 90 countries call for confinement*. Retrieved May 18, 2020, from euronews.com: <https://www.euronews.com/2020/04/02/coronavirus-in-europe-spain-s-death-toll-hits-10-000-after-record-950-new-deaths-in-24-hou>
- Secon, H., & Woodward, A. (2020, March 27). *A map of the US cities and states under lockdown — and those that are reopening*. Retrieved May 18, 2020, from msn.com: <https://www.msn.com/en->

sg/news/other/about-90-of-americans-have-been-ordered-to-stay-at-home-this-map-shows-which-cities-and-states-are-under-lockdown/ar-BB11MqgH

Sestili, C., Scalingi, S., Cianfanelli, S., Mannocci, A., Del, A., De, S., . . . La, G. (2018). Reliability and Use of Copenhagen Burnout Inventory in Italian Sample of University Professors. *International journal of environmental research and public health*, 15(8), 1708.

<https://doi.org/10.3390/ijerph15081708>

Shirom, A., Nirel, N., & Vinokur, A. (2010). Work hours and caseload as predictors of physician burnout: The mediating effects by perceived workload and by autonomy. *Applied Psychology: An International Review*, 59(4), 539–565. <https://doi.org/10.1111/j.1464-0597.2009.00411.x>

Sora, B., De Cuyper, N., Caballer, A., Peiró, J., & De Witte, H. (2013). Outcomes of job insecurity climate: The role of climate strength. *Applied Psychology: An International Review*, 62(3), 382–405.

<https://doi.org/10.1111/j.1464-0597.2012.00485.x>

Stamper, C. L., & Johlke, M. C. (2003). The impact of perceived organizational support on the relationship between boundary spanner role stress and work outcomes. *Journal of Management*, 29(4), 569-588. [https://doi.org/10.1016/S0149-2063\\_03\\_00025-4](https://doi.org/10.1016/S0149-2063_03_00025-4)

Standing, G. (2012). The precariat: From denizens to citizens? *Polity*, 44(4), 588-608.

<https://doi.org/10.1057/pol.2012.15>

Standing, G. (2014). The Precariat. *Contexts*, 13(4), 10-12. <https://doi.org/10.1177/1536504214558209>

Taylor, J. M. (2015). Psychometric analysis of the Ten-Item Perceived Stress Scale. *Psychological Assessment*, 27 (1 ), 90-101. <http://dx.doi.org/10.1037/a0038100>

Vischer, J. C. (2007). The effects of the physical environment on job performance: Towards a theoretical model of workspace stress. *Stress and health: Journal of the International Society for the Investigation of Stress*, 23(3), 175-184. <https://doi.org/10.1002/smi.1134>



Wood, B. A., Guimaraes, A. B., Holm, C. E., Hayes, S. W., & Brooks, K. R. (2020). Academic Librarian Burnout: A Survey Using the Copenhagen Burnout Inventory (CBI). *Journal of Library Administration*, 60(5), 512-531. <https://doi.org/10.1080/01930826.2020.1729622>

**Table 1***Demographics of the Sample (n = 326)*

| <b>Demographics</b>      | <b>Choices</b>  | <b>N</b> | <b>Percentage</b> |
|--------------------------|---|----------|-------------------|
| <b>Age</b>               | <b>18-34</b>  | 100      | 30.67             |
|                          | <b>35-54</b>  | 125      | 38.34             |
|                          | <b>55-older</b>   | 101      | 30.98             |
| <b>Gender</b>            | <b>Male</b>   | 153      | 46.93             |
|                          | <b>Female</b>   | 170      | 52.15             |
|                          | <b>Non-binary/ third gender/ Prefer not to say</b>            | 3        | 0.92              |
| <b>Education</b>         | <b>Less than 4-year degree</b>                                | 83       | 25.46             |
|                          | <b>4-year degree</b>  | 109      | 33.43             |
|                          | <b>Professional degree / Doctorate</b>                        | 134      | 41.10             |
| <b>Current Job Title</b> | <b>Administrator</b>  | 22       | 6.75              |
|                          | <b>Director</b>   | 15       | 4.60              |
|                          | <b>Educator</b>   | 42       | 12.88             |
|                          | <b>Executive</b>  | 24       | 7.36              |
|                          | <b>Manager/Supervisor</b>                                     | 105      | 32.21             |
|                          | <b>Professional (Lawyer, Doctor, Nurse, Accountant, etc.)</b> | 40       | 12.27             |
|                          | <b>Researcher</b>   | 12       | 3.68              |
|                          | <b>Student</b>  | 11       | 3.37              |
|                          | <b>Other</b>  | 55       | 16.87             |

**Figure 1***Word Cloud of Self-Reported Job Titles***Table 2***Remote Working Arrangements of the Sample*

| Demographics  | Choices    | Number | Percentage |
|---|------------|--------|------------|
| <b>Before COVID-19 did you only work remotely?</b>                          | Yes        | 133    | 40.80      |
|   | No         | 193    | 59.20      |
| <b>Before COVID-19 did your job allow you flexibility to work remotely?</b> | Yes        | 83     | 43.01      |
|   | No         | 110    | 59.99      |
| <b>If you had flexibility, how many hours/week did you work remotely?</b>   | 0-5        | 98     | 50.78      |
|   | 6-15       | 42     | 21.76      |
|   | 16-30      | 24     | 12.44      |
|   | 31 or more | 29     | 15.03      |

**Table 3***Number of Hours Worked and Total Work-Related Burnout Score*

| Number of Hours Worked for Pay | N   | Total Work-Related Burnout Score |         |
|--------------------------------|-----|----------------------------------|---------|
|                                |     | Mean                             | Std Dev |
| Less than 20                   | 23  | 42.39                            | 20.64   |
| 21-30                          | 51  | 47.27                            | 24.50   |
| 31-40                          | 151 | 46.97                            | 22.77   |
| 41-50                          | 75  | 45.33                            | 21.11   |
| More than 50                   | 26  | 66.76                            | 21.96   |

**Table 4***The most challenging aspects of working remotely are...(check all that apply)*

| Responses   | N   | Percentage |
|---|-----|------------|
| Maintaining appropriate levels of communication with my team/colleagues | 138 | 21.36      |
| Managing technology/communication tools                                 | 124 | 19.20      |
| Managing my time/Avoiding distractions                                  | 119 | 18.42      |
| Balancing personal/family responsibilities with workload                | 100 | 15.48      |
| Maintaining Productivity  | 89  | 13.78      |
| Receiving clear communication from supervisors/managers                 | 58  | 8.98       |
| Other   | 18  | 2.79       |
| Total   | 646 | 100        |

*Note:* Participants could select as few or as many options as they felt appropriate.