

COVID-19 CAREGIVING AVALANCHE: THE IMPACT ON EMOTIONAL EXHAUSTION ON FEMALE NATURAL SCIENCE AND ENGINEERING ACADEMICS

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Abstract

Gender disparity persists in the personal caregiving of children and older adults, and in professional caregiving duties, with many workplace policies and cultures favoring the “ideal worker” and presenting significant and continuing barriers to female caregivers’ professional success and well-being. The recent pandemic both highlighted and augmented this disparity as schools, daycares, and adult care facilities closed or implemented restrictions. This study interprets results from the July 2021 Canadian Natural Sciences & Engineering (NSE) Faculty Workplace Climate Survey by empirically assessing the impact on emotional exhaustion of the increased caregiving burden during the COVID-19 pandemic on female academics in the highly masculinized NSE fields. Results indicate that women were more likely to experience emotional exhaustion even when other factors were considered. Collegiality and inclusion were found to be protective factors, illustrating important implications for, and the retention and support of, success and well-being of female NSE academics.

Keywords: emotional exhaustion, caregiving, COVID-19 pandemic, gender, collegiality and inclusion, faculty

Résumé

La disparité entre les genres persiste dans la prestation de soins personnels aux enfants et aux personnes âgées : certaines cultures et politiques organisationnelles favorisent le « travailleur idéal » et présentent des obstacles importants pour la réussite professionnelle et le bien-être des mères de jeunes enfants et des aidantes naturelles. La récente pandémie a souligné et accru cette disparité : les écoles, garderies et établissements de soins ont fermé complètement ou partiellement, laissant les tâches aux familles concernées. Nous présentons ici les résultats de l’Enquête canadienne sur le climat de travail pour le corps professoral en sciences naturelles et en génie (SNG), menée en 2021 : cette étude empirique analyse l’impact de l’augmentation du fardeau de la prestation de soins pendant la pandémie de COVID-19 sur l’épuisement émotionnel des professeures. Les résultats indiquent que les femmes étaient plus susceptibles d’éprouver de l’épuisement émotionnel que les hommes, et que la collégialité et l’inclusion se sont révélées comme des facteurs de protection.

Mots-clés : épuisement émotionnel, prestation de soins, pandémie de COVID-19, genres, collégialité et inclusion, corps professoral

INTRODUCTION AND REVIEW OF THE LITERATURE

Work, running your home, childcare, homeschooling...all came down at once as an avalanche, and from what I've seen, predominantly on female faculty members. (P71, Female, White)

Post-secondary education landscapes, with their demands for high productivity, are hierarchical, male-dominated, and entrenched in policies and procedures designed to fit the “ideal worker” (described by Acker as a “gender neutral, abstract worker who has no body and no obligations outside the workplace: this worker is unencumbered” [Acker, 2012, p. 218]). Increasingly academic institutions have shifted from a focus on knowledge production and acquisition toward a capitalistic model. For academics, this has meant an increased number of students, classes, and service and administrative tasks, as well as a greater expectation to generate revenue through external research funding (Heller, 2016; Pope-Ruark, 2022; Sabagh et al., 2018; Watts & Robertson, 2011; Zábrodská et al., 2018).

Despite these general trends, there is an additional gendered element found in post-secondary institutions. The gendered landscape of academia is evident in the underrepresentation of women in full-professorial, tenured, and leadership roles (Effah & Kaufman, 2022; Kaufman & Colyar, 2022), which is even more pronounced in the hyper-masculinized and male-dominated natural sciences and engineering (NSE) disciplines (Dengate et al., 2019a). Women in these fields are more likely to report experiencing exclusion, alienation, discrimination, and harassment (Kaufman & Colyar, 2022); the outcome of long-embedded implicit and explicit bias, which has been empirically linked to decreased psychological well-being and burnout (Dengate et al., 2019b). Women experience additional barriers within academia as career milestones often overlap with those of reproduction, childcare, and the care of older adults as well as disproportionate expectations to participate in service and support work (Effah & Kaufman, 2022; Kaufman

& Colyar, 2022). Social gender norms and expectations also result in female academics being tasked with more student caregiving and service duties than men, which inevitably takes time and energy away from their research—an essential component to career advancement. The cumulative result is that female faculty often experience additional barriers to advancement and high research productivity.

With the additional challenges female caregiving academics face, many have developed individual strategies to help them navigate their professional landscape, including prioritizing time for work and family to the detriment of time for social interaction and self-care, self-selecting out of “traditional” academic roles, family planning around career advancement timelines, and creating networks (formal and informal) with other academics (Effah & Kaufman, 2022); the latter which often provides caregiving mothers a sense of belonging through these supportive and non-judgemental networks (Smith-Carrier et al., 2021). This experience of collegiality, in addition to factors such as representation of women in leadership and support from academic leadership (regardless of gender identity), has been found to increase well-being, job satisfaction, employee retention, and productivity (Dengate et al., 2021a; Innstrand & Grødal, 2022). However, as Innstrand and Grødal (2022) show, perceived inclusion is more common among men within academia than women, which highlights yet another gender-related barrier for women.

Beginning in March 2020, the COVID-19 pandemic (herein, the pandemic) had a tumultuous impact on Canadians as federal, provincial, and territorial governments imposed restrictions aimed at containing the virus. Protective measures such as lockdowns, face masks, social distancing, and isolation when ill instantaneously changed the way personal, social, and professional lives were navigated. The mental health impact was immediate, as many people struggled with isolation, anxiety, grief, uncertainty, and news overload. For example, a general decrease in well-being and increased levels of depression, anxiety, and substance abuse were reported, often co-occurring (Dozois et al., 2021, LifeWorks, 2022). The result is that the

mental health and well-being of many Canadians rapidly deteriorated (LifeWorks, 2020) and have yet to return to pre-pandemic levels.

The pandemic served to highlight other pre-existing disparities. More specifically, demands on unpaid domestic work increased substantially with the shuttering of schools and daycares, the transition to virtual learning (resulting in the additional roles of teacher and technical support), and restrictions placed on access to older adult care facilities and other support resources (Lightfoot et al., 2021; Power, 2020; Thomson et al., 2021). As family, work, and learning overlapped in both geographical space and schedules, many caregivers, in their attempt to balance multiple roles and responsibilities amidst the ever-changing pandemic landscape, experienced heightened stress (Craig & Churchill, 2021; Obeng et al., 2022). For instance, caregivers of older adults experienced additional stressors including anxiety of the risk of COVID to those in care homes, the impact of pandemic restrictions on the care relationship, and limitations on visiting (Lightfoot et al., 2021). Moreover, for many parents of dependent children, the pandemic significantly increased caregiving hours “equivalent to a full-time working week” (Sevilla & Smith, 2020, p. S183). While parents overall experienced a decrease in their well-being during the pandemic due to their much-expanded demands in both their personal and professional lives, a greater impact was found in working women with children under 15 years of age (Butterworth et al., 2022; see also Cannito & Scavarda, 2020).

Within educational institutions, pandemic changes brought, almost overnight, a shift to remote work and learning, a transition requiring vast amounts of energy, time, and increased stress (Flaherty, 2020a). The student care load also increased significantly as many students experienced pandemic-related stress and crisis. Prior to the pandemic, research showed that female academics were more likely to shoulder the student caregiving load, which is commonly referred to as emotional labour (Dengate et al., 2019a). Within NSE disciplines, the relatively low number of female academics results in an even more concentrated student caregiving load than in other fields.

The pandemic has become a long-term stressor with significant global impacts on mental and physical health, affecting resilience, productivity, and capacity for empathy, all of which can lead to burnout. According to the World Health Organization (WHO), burnout is a syndrome that can be a factor in the development or aggravation of other physical and mental health issues, and is the result of unmanaged chronic workplace stress (World Health Organization, 2019). While results between binary gender and burnout are mixed, some studies have highlighted differences in the way men and women experience burnout (Sabagh et al., 2018; Watts & Robertson, 2011). In addition, within the academy, many of the pre-existing stressors inherent in their roles as educators and scholars significantly increase faculty members’ burnout risk, and the confluence of the pandemic created a “perfect storm” for burnout (Flaherty, 2020a, para. 24). Within the conceptual definition of burnout, there are three elements: emotional exhaustion, cynicism and depersonalization, and reduced professional efficacy—all of which are regarded as separate from, albeit often highly correlated with, depression and anxiety. According to Maslach, Schaufeli, and Leiter (2001):

The exhaustion component represents the basic individual stress dimension of burnout. It refers to feelings of being overextended and depleted of one’s emotional and physical resources. The cynicism (or depersonalization) component represents the interpersonal context dimension of burnout. It refers to negative, callous, or excessively detached response to various aspects of the job. The component of reduced efficacy or accomplishment represents the self-evaluation dimension of burnout. It refers to feelings of incompetence and a lack of achievement and productivity at work. (p. 399)

Emotional exhaustion is regarded as the first hallmark of burnout (Pope-Ruark, 2022), which extends beyond a particularly onerous week (e.g., end-of-term grading) as it is systemic and continuous. Research has found that emotional

exhaustion is the component of burnout most likely to be experienced by women (Peter et al., 2020; Pope-Ruark, 2022).

It is through the foundations of West and Zimmerman's theory of *Doing Gender* (1987), Acker's *Ideal Worker* (2012), and Hochschild and Machung's gender and work theory of the *Second Shift* (2012) that we explore the impact of increased caregiving during the COVID-19 pandemic on female caregiving NSE academics. Vadnais (2023) "posited that people 'do gender' in order to be perceived as competent within society, and this consists of actions within interactions informed by the assumption that others, similarly culturally-conditioned, perceive gender" (p. 25). Acker (2012) asserts that workplaces and work culture are structured to best fit those who do not have obligations outside of the workplace, which create barriers to prioritizing the majority of one's energy and time toward work; termed as the ideal worker. Finally, Hochschild and Machung (2012) studied the impact of the second shift that women perform in addition to their paid work; that despite societal shifts toward equality between genders, women continue to engage in a significantly greater amount of caregiving and domestic responsibilities compared to men. With this theoretical context, the study shows that the continuing gendered distribution of caregiving duties within both domestic and professional spheres, increased by the COVID-19 pandemic, has a significant impact on the mental health and well-being of female caregiving NSE academics.

THE CURRENT STUDY

Parenthood "remains the most gender-typed social role in adulthood" (Roskam & Mikolajczak, 2020, p. 485), with women taking on greater caregiving roles with both children and older adults, which can impact their choice of profession and career trajectory (Sevilla & Smith, 2020). Specific to NSE disciplines, where much research and supervision of students requires on-site attendance and offers less scheduling flexibility, caregiving can be an additional barrier to women (Effah & Kaufman, 2022). The advent of the pandemic served to reinforce and exagger-

ate the pre-existing inequalities in the distribution of domestic and caregiving labour (Butterworth et al., 2022), both at home and in the workplace, with the net effect being an increase in feelings of emotional exhaustion.

While previous research has found that women are more likely tasked with tending to the emotional labour of students, child caregiving, and older adult care, all of which were elevated to acute levels during the pandemic, none have examined the cumulative impact of all three and its impact on emotional exhaustion, particularly among female scholars in male-dominated NSE disciplines. In addition, little empirical research has examined how the impact of collegiality and inclusion at the unit/department moderates and protects against emotional exhaustion (a notable exception is Peter et al., 2020). Workplace culture, in particular collegiality and the perception of inclusion, is of special interest as it represents something post-secondary institutions can specifically influence through policy, practice, and departmental and organizational culture, and can therefore tangibly enhance the well-being and professional success of academics generally, and women scholars more specifically. As such, the purpose of the present study is to empirically test what impact pandemic-based extra caregiving responsibilities had on the emotional exhaustion of academics, and the extent to which binary gender and increased caregiving and/or workplace culture moderates this initial relationship. More specifically, the current study seeks to contribute to and expand on the existing literature by positing the following research questions:

1. What impact, if any, did increased caregiving due to the pandemic have on the emotional exhaustion of faculty members after controlling for key demographics (gender, having children under 18, racialized identity, and marital/common-law partner status)?
2. Does collegiality and inclusion serve as a protective factor against emotional exhaustion?
3. Does gender and collegiality/inclusion moderate the relationship between increased caregiving during the pandemic and emotional exhaustion?

DATA

Data for the present analysis is drawn from the Canadian Natural Sciences and Engineering (NSE) Faculty Workplace Climate Survey—Ontario region, conducted between June and July 2021 (Dengate et al., 2022). Invitations to participate in the survey in French and English were sent to NSE faculty from nine Ontario universities (Carleton, Laurentian, McMaster, Queen's, Ryerson [now Toronto Metropolitan], Guelph, Ottawa, Toronto, and Waterloo). The non-probability sampling frame was developed through online searches of each university's website, from which faculty names and email addresses were collected from NSE disciplines, with a focus on tenure/tenure-track and teaching lecturers with ongoing appointments. (Note: The study focuses on professors and teaching lecturers in an ongoing position rather than contract lecturers, whose precarious form of employment is well problematized and who are quite probably at a greater risk for burnout and less likely to experience collegiality and inclusion in their departments; however, such analyses were simply beyond the sampling frame of the current study).

In total, 472 NSE faculty participated in the survey, with a final usable sample of 341 for the current analyses due to not completing the majority of the questionnaire. Three-quarters (75%) were tenured academics; nearly half (47%) were full professors, followed by 25% associate professors, 11% assistant professors, and 17% instructor/lecturers. Almost two-thirds (64%) were male (there were less than five individuals who identified their gender as non-binary, so for ethical reasons could not be included in this study), which is similar to other NSE Canadian studies (Canadian Association of University Teachers, 2014). More than four out of five (83%) identified as White, and 95% as heterosexual; however, there are no national studies to verify the representation of these demographics in NSE disciplines. Regarding age, 14% were under 40, 31% between 41 and 50, 34% between 51 and 60, and 21% over the age of 60. Most (84%) respondents reported being in a married or common-law relationship, and

76% indicated having children (37.5% with children under the age of 18). Female respondents were only slightly less likely to report having children than men (75% vs. 78%).

MEASURES

Emotional Exhaustion

The outcome measure, emotional exhaustion, was based on three Likert-scale items, which were used to form a composite index and mean centred through standardized z-scores (i.e., a mean of zero and a standard deviation of one) with high values corresponding to greater emotional exhaustion ($\alpha = .88$). Specifically, respondents were asked, in the context of their pandemic workload, their level of agreement to the statements: "I feel emotionally 'used up' by the end of each day," "I feel emotionally drained from work," and "I feel more overwhelmed than usual by the total amount of work I have to do each day."

Caregiving

The main explanatory measure, increased caregiving load, was based on the two five-point Likert-scale items. The first assessed whether time spent on caregiving (e.g., childcare, older adult care, or caring for another sick/injured individual) increased or decreased during the pandemic, while the second asked respondents the extent to which, compared to pre-COVID-19, the time spent discussing non-academic/personal matters (e.g., students' mental health or financial concerns) increased or decreased. Since the strength of the association was moderate and statistically significant ($r = .23$, $p < .001$), the two items were computed into a standardized index with higher values representing greater increases in caregiving responsibilities.

Collegial Support and Inclusion

Collegiality and inclusion was included to assess for potential interaction effects. Seven individual, 5-point agreement items were used to create an index ($\alpha = .86$), with higher scores

corresponding to greater collegial support and inclusion. Example items include “when necessary, I am able to ask a colleague for advice,” “my chair provides positive encouragement to me,” and “I have had my opinions ignored by my colleagues” (reverse coded).

Controls

In addition, binary gender (36% women), racialized identity (17.3%), having children under the age of 18 (37.5%), and married or common-law relationship (CLR) status (84%) were included as controls—all of which were binary coded, with one representing women, racialized, children under 18, and married or in a CLR.

ANALYTICAL PROCEDURES

Quantitative analyses consisted of hierarchical linear regression using IBM SPSS, version 29.0. Model 1 included the exogenous control variables, model 2 assessed the impact and significance of increased caregiving during the pandemic on emotional exhaustion, model 3 added the collegiality and inclusion index, and model 4 tested the two multiplicative interaction effects: gender and the caregiving index as well as gender and the collegiality index. Effect sizes by way of beta coefficients were used to assess the “practical significance” of the results (Kirk,

1996; Nieminen et al., 2013) in addition to probability-based inferential testing methods. Keith (2019) itemizes the effect size of standardized coefficients within social science research as follows: <0.05 is too small to interpret; ≥ 0.05 is small but meaningful; ≥ 0.10 is moderate; and ≥ 0.25 is large. Moreover, the standardized nature of the measures, so that their variances are equal to one, represent how many standard deviations the outcome variable (i.e., emotional exhaustion) will increase/decrease per a standard deviation change in the predictor measure. Prior to the statistical analyses, assumption testing was performed to check for normality, linearity, outliers (uni- and multi-variate analysis), homogeneity of variance, and multicollinearity, with no violations found (Tabachnick & Fidell, 2019). Finally, a review of the open-ended qualitative responses was used to provide a richer context to the quantitative results in the discussion.

RESULTS

Table 1 provides Pearson’s correlation coefficients for all measures included in the multivariate model.

Results from the OLS regression models with emotional exhaustion as the outcome measure are presented in Table 2. In terms of demographic information, significant coefficients were found for gender (women) ($\beta = .209$) and

Table 1

Bivariate Correlations

	1	2	3	4	5	6	7
1. Emotional exhaustion	1						
2. Increased caregiving	.33***	1					
3. Collegiality and inclusion	-.34***	-.17**	1				
4. Binary gender	.23***	.21***	-.25***	1			
5. Racialized identity	-.07	-.02	.02	-.04	1		
6. Marital/common-law status	-.11	-.13*	.21***	-.21***	.05	1	
7. Children under 18	.13*	.35***	.09	.03	.09	.14*	1

Note: * $p < .05$; ** $p < .01$; *** $p < .001$

having children under 18 ($\beta = .143$), both of which have a moderate effect size; however, racialized identity and marital/common-law status had no significant influence on emotional exhaustion. When the main exogenous measure was added in model 2 the significant association was maintained for gender while having children under 18 was no longer statistically significant. The strongest relationship was increased caregiving responsibilities during the pandemic ($\beta = .274$), which had a positive strong/large impact on emotional exhaustion.

Model 3 included workplace collegiality and inclusion, which was inversely related to emotional exhaustion ($\beta = -.278$) with a large/strong effect size, as was increased caregiving ($\beta = .231$); however, the significance of gender disappears when collegiality and inclusion was entered (i.e., is spurious). Finally, results from the full model show that increased caregiving remains a significant predictor of emotional exhaustion ($\beta = .219$) as well as collegiality and inclusion ($\beta = -.421$), but now gender ($\beta = .131$) is once again significant.

Table 2

OLS Regression by Emotional Exhaustion (Hierarchal Entry)

	Model 1		Model 2		Model 3		Model 4	
	b	β	b	β	B	β	b	β
Intercept	-.045 (.166)		-1.15 (.301)***		-1.04 (.290)***		-.927 (.319)**	
Respondent gender	.434 (.125)***	.209	.336 (.123)**	.162	.233 (.121)	.107	.271 (.121)*	.131
Racialized identity	-.183 (.156)	-.069	-.183 (.151)	-.069	-.184 (.145)	-.070	-.149 (.144)	-.057
Children < 18	.295 (.123)*	.143	.088 (.128)	.042	.162 (.124)	.078	.174 (.125)	.085
Marital/common-law status	-.227 (.165)	-.084	-.124 (.161)	-.046	-.024 (.156)	-.009	-.080 (.155)	-.030
Increased caregiving			.274 (.063)***	.274	.231 (.061)***	.231	.219 (.069)**	.219
Collegiality and inclusion					-.278 (.058)***	-.278	-.421 (.071)***	-.421
Gender * Caregiving							.015 (.124)	.009
Gender * Collegiality and inclusion							.403 (.119)***	.241
r ² (adjusted)	.081		.142		.211		.221	
F change in r ²	5.82***		18.81***		22.70***		5.75**	

* $p < .05$; ** $p < .01$, *** $P < .001$

The final objective is to examine what effect, if any, including multiplicative interaction terms had in predicting emotional exhaustion. Since the emotional exhaustion index was standardized into z-score units, scores over zero represent above average emotional exhaustion, while negative values correspond to below average emotional exhaustion. While the interaction effect between gender and increased caregiving was not significant, there was a significant moderating effect between gender and the collegiality and inclusion index—meaning, the significant (inverse) relationship between collegiality and inclusion on emotional exhaustion exists for women, but not men (Figure 1). Put another way, women who reported high collegiality and inclusion had substantially lower levels of emotional exhaustion (-0.8 SD), while women who indicated low collegiality and inclusion recorded emotional exhaustion scores that were 1.3 standard deviations above the mean.

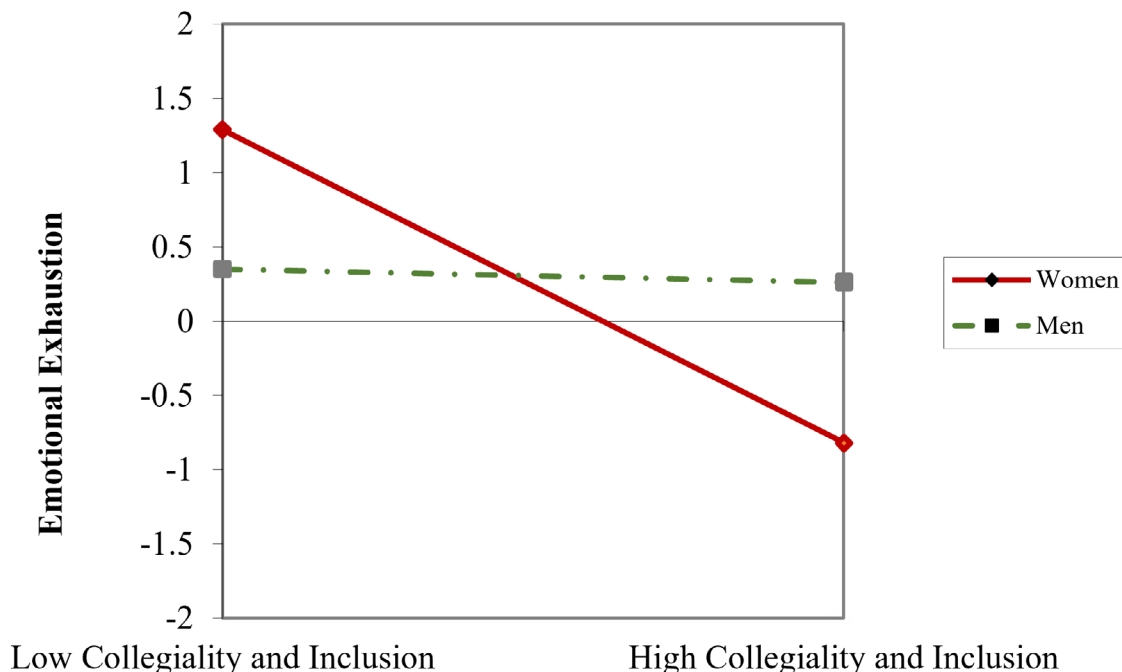
DISCUSSION

The present study is one of the first to examine the combined impact of increased caregiving imposed by the pandemic on emotional exhaustion, and whether gender and collegiality effectively moderates the zero-order relationship. Several noteworthy results were found. Each will be elaborated on according to the aforementioned research questions, with qualitative results included to provide context to the statistical findings, as well as a discussion of the concept of the second shift (Hochschild & Machung, 2012) and doing gender (West & Zimmerman, 1987) to provide a theoretical explanation.

Regarding the first research question, previous literature informed a hypothesis that faculty with increased caregiving due to the pandemic would report higher levels of emotional exhaustion, as would women, respondents with children under 18, and racialized academics. Apart from racialized identity, which was not significant, results support such a hypothesis, and were also affirmed in many of the open-ended comments. Some example narratives are provided below from two female faculty members.

Figure 1

Interaction Term (Gender and Collegiality and Inclusion) on Emotional Exhaustion



It is necessary to work long hours to be fully successful in the system. (P55; Female, White)

Finding time to do all means no life balance...long days, working on weekends and legal holidays, not taking vacation time... (P216; Female, Racialized)

The significant correlation between binary gender identity and emotional exhaustion is supported by previous research in that women are more likely to experience burnout (Pope-Ruark, 2022). Within the masculinized NSE disciplines, women often find themselves more heavily loaded with service tasks, such as participation on various committees, especially when there is a need for gender representation. While the academic workload is typically divided between research, teaching, and service duties (e.g., 40%/40%/20%, respectively), the additional service load experienced by women often goes unrecognized and can take away from research time, creating barriers to obtaining tenure and promotion (Dengate et al., 2021b).

The pandemic added to the already high workload experienced by many academics. The sudden switch to remote teaching required the set-up of a home office conducive to video recording and/or online teaching, paired with learning new technologies and transitioning in-class materials to virtual formats; this with often minimal support and resources from their units or their institutions that were managing the broader-based pivot to remote work. Student contact for course-based questions as well as mental health concerns increased significantly, the latter which research has claimed is disproportionately shouldered by female faculty and is articulated in the following example narratives by women NSE survey participants.

Major increase in dealing with students/grad students mental health crisis on top of my own deteriorating mental health. (P447; Female, White)

Students needed so much more time and support both academically and emotionally. (P174; Female, White)

Providing emotional support is not my strong suit, but I have been asked to do it much more during the pandemic. (P38; Female, White)

Empirical results from the current study highlight the continuing phenomenon of the second shift, with many indicating the difficulty of maintaining their expected academic productivity as well as taking care of their families. The second shift, a term coined by Hochschild and Machung (1989), explains how enduring historical, economic, and sociological ideologies of gender roles have resulted in significant inequities in the distribution of the often invisible and grossly undervalued caregiving loads (inclusive of child- and older adult-care and household domestic duties) between men and women. In the 2012 update of their book, the authors found that women continue to shoulder significantly more of this load, putting in two additional weeks' worth of work per year compared to men, and enjoying less leisure time. As our current survey participants emphasize, the continuing phenomenon of the second shift within the pandemic exacerbates stress-related mental health impacts, including emotional exhaustion.

Women still seem to be shouldering more of the burden particularly with their families during COVID 19 and in fact always. (P19; Female, White)

This takes some emotional energy and tends to eat into time that would otherwise allow one to charge up their batteries. There is no rest in the age of COVID. (P174; Female, White)

As the above narratives illustrate, pandemic-based lockdowns, restrictions, school and daycare closures, remote learning, and the changing or additional care duties for older adults resulted in elevated levels of emotional exhaustion, which several female participants recognized as being disproportionately gendered.

The pandemic widened the gender differences: women in academia who have children were forced to do all the home-

based childcare while maintaining a full academic workload, which was only greater due to the transition to online teaching. The result is an impact on their productivity which will add up to the sex-based gap in the field. (P305; Female, White)

The burden of care and academic support for children as well as for other domestic tasks is much higher for women than for men. (P204, Female, White)

A possible explanation is linked to the concept of doing gender (West & Zimmerman, 1987), by which social expectations of women to engage in a more nurturing, caring, and selfless (or other-focused) way adds additional layers of work, whether that be paid or unpaid, emotional, or practical. The outcome for women is the loss of time away from other tasks including leisure time, which depletes their energy and, over time, can contribute to the experience of emotional exhaustion (Nagoski & Nagoski, 2020). Within the male-dominated and masculinized NSE disciplines here, female academics are more likely to experience gender-based discrimination, and “doing gender” may be magnified, with the result being an even stronger push toward the service and caregiving aspects of their roles.

Results also addressed the second research question, as there was a significant inverse association between collegiality and inclusion on emotional exhaustion; in other words, collegiality and inclusion serves as a protective factor against emotional exhaustion. As outlined by the collegiality and inclusion index questions in the survey, the protective aspect of collegiality and inclusion means that a person feels respected and supported by colleagues for the work they do, believes that they are included within the academic “team,” and perceives themselves to be welcome to give and solicit advice and support when needed. By way of contrast, a negative experience of collegiality and inclusion is that of feeling disrespected as a person and/or as an academic, experiencing their work and expertise as being disregarded or

denigrated, and being opposed or undermined by colleagues. Of course, the highly competitive, productivity-focused, and hierarchical nature of academia poses a significant challenge to creating a collegial and inclusive workplace culture; yet our findings show that collegial cultures reduce experiences of emotional exhaustion. Many of the qualitative responses from faculty highlight the impact of positive workplace collegiality and inclusion, a sample of which are illustrated below.

My immediate departmental colleagues are strongly supportive. We have excellent leadership in our current chair and I feel like a valued member of the departmental community. (P74; Male, White)

Most of the people are truly and sincerely supportive and collegial, which is what gives me hope and positive encouragement. I try to surround myself with them as much as I can. (P71; Female, White)

The juxtaposition of a lack of collegiality and ultimately exclusion was also commented on in several of the open-ended narratives, which is often deeply rooted in various systems of oppression, including sexism, racism, colonial privilege, and other forms of power imbalance. As two female academics write:

“I don’t think my faculty treats women well, and this stems from the leadership...[who have never] done anything to address this culture. (P443; Female, White)

[The university] is plagued by deep-seated subtle racism and sexism and colonialism that is embedded into all forms of assessment and evaluation, and how people’s value is judged by others. It is very hierarchical with power structures that lead to the exploitation of people in the system of lower prestige or status. The power structures make it hard to treat all humans with equal dignity. (P86; Female, White)

The qualitative responses also show that the experience of collegiality and inclusion can vary greatly depending on the type of academic position held by the respondent. Like most academic units, a clear hierarchy exists within NSE disciplines, with research faculty, especially those with tenure, holding the highest status. Participants who held positions focused on teaching or were contract lecturers or sessional instructors reported greater perceptions of exclusion based on the implicit status hierarchy embedded within academic institutions. As one female respondent writes, “Teaching-stream positions are not valued by the faculty” (P86; Female, White).

The final research question addressed whether gender and collegiality/inclusion moderates the relationship between increased caregiving during the pandemic and emotional exhaustion. Results show that while collegiality and inclusion did not have a significant impact on emotional exhaustion for male NSE academics, it did have a significant moderating effect for female NSE academics. In particular, the steepest slope (Figure 1) for the relationship between collegiality/inclusion and emotional exhaustion was among female faculty—even while controlling for increased caregiving demands. As such, while additional caregiving duties brought on from the pandemic have been identified as risk factors for emotional exhaustion, especially among women, the significant collegiality interaction term, at least for female faculty, has been identified as an important protective factor against emotional exhaustion.

LIMITATIONS AND STRENGTHS

As with all research, the current study has both strengths and limitations. First, the singular and cumulative impact of student emotional labour, child caregiving, and older adult care in its operational definition, while rarely analyzed together, makes it difficult to unpack with relative precision in terms of which has a larger impact on emotional exhaustion. Certainly, there is a growing body of research that has highlighted

the gender difference in the emotional labour of students (Dengate et al., 2021b, 2019a; Flaherty, 2020b), child caregiving (Flaherty, 2020a; Misra et al., 2012; Smith-Carrier et al., 2021), and older adult care (Lightfoot et al., 2021); however, how these intersect with each other as well as the impact on emotional exhaustion is unknown. While the open-ended comments provided by participants shed some light, a more comprehensive qualitative analyses using in-depth interviews and/or focus groups is needed to adequately unpack the statistical evidence found in the current study.

Second, due to the statistical restraints of a moderate sample size, a robust intersectionality analysis could not be conducted. Nevertheless, previous research has found that racialized women are at an increased risk for burnout (Pope-Ruark, 2022). Such a connection could not be validated in the current study. In addition, equity and anti-oppression extends beyond binary gender and racialized identity; as such, future research would be best served to examine the impact of various historically marginalized and systemically disadvantaged groups (including Indigenous identity, disability, and sexual and/or gender minoritized identities), ideally within an intersectionality lens.

CONCLUDING REMARKS

While many institutions have enacted well-being, mental health and equity, diversity, and inclusion (EDI) initiatives, these are often construed as mutually exclusive entities. This study shows that a confluence of these initiatives, even in part, could bring about substantial and impactful change in reducing the experience of emotional exhaustion, especially for female caregiving academics in NSE disciplines. With post-pandemic life returning to the “new normal,” it could be argued that these results ought to be dismissed as simply a blip in history and that the increased caregiving demands brought about by the pandemic, and its subsequent effect on emotional exhaustion, was time-specific and acute. We argue, however, that the pandemic simply served to expose pre-existing and longstanding inequities and, as such, should be regarded as an op-

portunity for universities to change and improve these chronic conditions rather than dismiss and ignore them. Finally, the association between increased caregiving responsibilities, elevated to extreme levels during the pandemic, and emotional exhaustion (a key aspect of burnout) is an important finding in and of itself; however, the present study identifies a key interaction that moderates its impact—that of gender and collegiality/inclusion. This is valuable information upon which to act, as it confirms that working environment matters and is a key protective factor against emotional exhaustion for women working in academia, and indicates the potential for targeted interventions within NSE disciplines to support the hiring, retention, and well-being of their female academics.

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REFERENCES

- Acker, J. (2012). Gendered organizations and intersectionality: Problems and possibilities. *Equality, Diversity and Inclusion: An International Journal*, 31(3), 214–224. <https://doi.org/10.1108/02610151211209072>
- Butterworth, P., Schurer, S., Trinh, T.-A., Vera-Toscano, E., & Wooden, M. (2022). Effect of lockdown on mental health in Australia: Evidence from a natural experiment analysing a longitudinal probability sample survey. *The Lancet Public Health*, 7(5), e427–e436. [https://doi.org/10.1016/S2468-2667\(22\)00082-2](https://doi.org/10.1016/S2468-2667(22)00082-2)
- Canadian Association of University Teachers. (2014). *CAUT almanac of post-secondary education in Canada 2013-2014*. https://www.caut.ca/docs/default-source/almanac/almanac_2013-2014_print_finalE20A5E-5CA0EA6529968D1CAF.pdf?sfvrsn=2
- Cannito, M., & Scavarda, A. (2020). Childcare and remote work during the COVID-19 pandemic. Ideal worker model, parenthood and gender inequalities in Italy. *Italian Sociological Review*, 10(3S), 801–820,801A. <https://doi.org/10.13136/isr.v10i3S.399>
- Craig, L., & Churchill, B. (2021). Dual-earner parent couples' work and care during COVID-19. *Gender, Work & Organization*, 28(S1), 66–79. <https://doi.org/10.1111/gwao.12497>
- Dengate, J., Farenhorst, A., Peter, T., & Franz-Odendaal, T. (2021b). Gender inequality in research and service amongst natural sciences and engineering professors in Canada. *International Journal of Gender, Science and Technology*, 13(1), 23–42. <https://genderandset.open.ac.uk/index.php/genderandset/article/view/656>
- Dengate, J., Farenhorst, A., Peter, T., & Mavriplis, C. (2022). Canadian Natural Sciences & Engineering (NSE) Faculty Workplace Climate Survey Results – Ontario region. *Unpublished Report*.
- Dengate, J., Hoffart, R., Peter, T., Farenhorst, A., & Franz-Odendaal, T. (2021a). The effect of women academic leaders on Canadian natural sciences and engineering professors. *Canadian Journal of Higher Education*, 51(2), 1–14. <https://doi.org/10.47678/cjhe.vi0.188941>
- Dengate, J., Peter, T., & Farenhorst, A. (2019a). Gender and the faculty care gap: “The obvious go-to person” for Canadian university students' personal problems. *Canadian Journal of Higher Education*, 49(3), 104–114. <https://doi.org/10.47678/cjhe.v49i3.188311>
- Dengate, J., Peter, T., Farenhorst, A., & Franz-Odendaal, T. (2019b). Selective incivility, harassment, and discrimination in Canadian sciences & engineering: A sociological approach. *International Journal of Gender, Science & Technology*, 11(2), 332–353. <https://genderandset.open.ac.uk/index.php/genderandset/article/view/648>

- Dozois, D. J. A., Peoples, A., Cooper, M., Trainer, J., Kelly, B. (2021). Anxiety and depression in Canada during the COVID-19 pandemic: A national survey. *Canadian Psychology, 62*(1), 136–142. <https://doi.org/10.1037/cap0000251>
- Effah, H., & Kaufman, A. (2022). “It’s not perfect, but the needle has moved”: Women’s experiences in academic STEM. Higher Education Quality Council of Ontario. <https://heqco.ca/women-in-academia-intro-to-part-five/>
- Flaherty, C. (2020a, September 13). *Burning out*. Inside Higher Ed. <https://www.insidehighered.com/news/2020/09/14/faculty-members-struggle-burnout>
- Flaherty, C. (2020b, November 18). *Faculty pandemic stress is now chronic*. Inside Higher Ed. <https://www.insidehighered.com/news/2020/11/19/faculty-pandemic-stress-now-chronic>
- Heller, H. (2016). *The capitalist university: The transformations of higher education in the United States since 1945*. Pluto Press.
- Hochschild, A., & Machung, A. (1989). *The second shift: Working parents and the revolution at home*. Viking Press.
- Hochschild, A., & Machung, A. (2012). *The second shift: Working families and the revolution at home* (rev. ed.). Penguin Books.
- Innstrand, S. T., & Grødal, K. (2022). Antecedents and consequences of perceived inclusion in academia. *International Journal of Environmental Research and Public Health, 19*(1), Article 1. <https://doi.org/10.3390/ijerph19010431>
- Kaufman, A., & Colyar, J. (2022). *Canadian academia and the faculty gender gap*. Higher Education Quality Council of Ontario. <https://heqco.ca/women-in-academia-intro-to-part-one/>
- Keith, T. Z. (2019). *Multiple regression and beyond: An introduction to multiple regression and structural equation modeling*. Routledge.
- Kirk, R. E. (1996). Practical significance: A concept whose time has come. *Educational and Psychological Measurement, 56*, 746–759. <https://doi.org/10.1177/0013164496056005002>
- LifeWorks. (2020). *The mental health index report: Spotlight on the mental health impact of the COVID-19 pandemic (Canada)*. <https://lifeworks.com/en/mental-health-index>
- LifeWorks. (2022). *The mental health index by LifeWorks*. Telus Health. <https://lifeworks.com/en/mental-health-index>
- Lightfoot, E., Moone, R., Suleiman, K., Otis, J., Yun, H., Kutzler, C., & Turck, K. (2021). Concerns of family caregivers during COVID-19: The concerns of caregivers and the surprising silver linings. *Journal of Gerontological Social Work, 64*(6), 656–675. <https://doi.org/10.1080/01634372.2021.1898512>
- Maslach, C., Schaufeli, W. B., Leiter, M. P. (2001). Job burnout. *Annual Review of Psychology, 52*(1), 397–422. <https://doi.org/10.1146/annurev.psych.52.1.397>
- Misra, J., Lundquist, J. H., & Templer, A. (2012). Gender, work time, and care responsibilities among faculty. *Sociological Forum, 27*(2), 300–323. <https://doi.org/10.1111/j.1573-7861.2012.01319.x>
- Nagoski, E., Nagoski, A. (2020). *Burnout: The secret to unlocking the stress cycle*. Ballantyne Books.
- Nieminen, P., Lehtiniemi, H., Vahakangas, K., Huusko, A., & Rautio, A. (2013). Standardised regression coefficient as an effect size index in summarizing findings in epidemiological studies. *Epidemiology Biostatistics and Public Health, 10*(4), 1–15. <https://doi.org/10.2427/8854>
- Obeng, C., Slaughter, M., & Obeng-Gyasi, E. (2022). Childcare issues and the pandemic: Working women’s experiences in the face of COVID-19. *Societies, 12*(4), 103. <https://doi.org/10.3390/soc12040103>

- Peter, T., Dengate, J., Farenhorst, A., & Franz-Odendaal, T. (2020). Department culture in Canadian sciences & engineering: An empirical test of the culture conducive to women's academic success model. *Journal of Women and Gender in Higher Education*, 13(2), 175–192. <https://doi.org/10.1080/26379112.2020.1784753>
- Pope-Ruark, R. (2022). *Unraveling faculty burnout: Pathways to reckoning and renewal*. Johns Hopkins University Press. <http://ebookcentral.proquest.com/lib/umanitoba/detail.action?docID=29138944>
- Power, K. (2020). The COVID-19 pandemic has increased the care burden of women and families. *Sustainability: Science, Practice and Policy*, 16(1), 67–73. <https://doi.org/10.1080/15487733.2020.1776561>
- Roskam, I., & Mikolajczak, M. (2020). Gender differences in the nature, antecedents and consequences of parental burnout. *Sex Roles*, 83(7–8), 485–498. <https://doi.org/10.1007/s11199-020-01121-5>
- Sabagh, Z., Hall, N. C., & Saroyan, A. (2018). Antecedents, correlates and consequences of faculty burnout. *Educational Research*, 60(2), 131–156. <https://doi.org/10.1080/00131881.2018.1461573>
- Sevilla, A., & Smith, S. (2020). Baby steps: The gender division of childcare during the COVID-19 pandemic. *Oxford Review of Economic Policy*, 36(Supplement 1), S169–S186. <https://doi.org/10.1093/oxrep/graa027>
- Smith-Carrier, T. A., Benbow, S., Lawlor, A., & O'Reilly, A. (2021). “My only solution is to work later and sleep less”: Exploring the perspectives of parenting in academia in Ontario, Canada. *Equality, Diversity and Inclusion: An International Journal*, 40(8), 930–946. <https://doi.org/10.1108/EDI-12-2020-0357>
- Tabachnick, B. G., & Fidell, L. S. (2019). *Using multivariate statistics* (7th ed.). Pearson.
- Thomson, K. C., Jenkins, E., Gill, R., Richardson, C. G., Gagné Petteni, M., McAuliffe, C., & Gadermann, A. M. (2021). Impacts of the COVID-19 pandemic on family mental health in Canada: Findings from a multi-round cross-sectional study. *International Journal of Environmental Research and Public Health*, 18(22), 12080. <https://doi.org/10.3390/ijerph182212080>
- Vadnais, A. J. (2023). *‘Doing gender’ and the second shift in the new normal: The impact of caregiving during Covid on female NSE academics’ emotional exhaustion and the protective factor of collegiality and inclusion* [Unpublished honors thesis]. University of Manitoba.
- Watts, J., & Robertson, N. (2011). Burnout in university teaching staff: A systematic literature review. *Educational Research*, 53(1), 33–50. <https://doi.org/10.1080/00131881.2011.552235>
- West, C., & Zimmerman, D. H. (1987). Doing gender. *Gender & Society*, 1(2), 125–151. <https://doi.org/10.1177/0891243287001002002>
- World Health Organization. (2019, May 28). *Burnout an “occupational phenomenon”*: International Classification of Diseases. <https://www.who.int/news/item/28-05-2019-burn-out-an-occupational-phenomenon-international-classification-of-diseases>
- Záborská, K., Mudrák, J., Šolcová, I., Květon, P., Blatný, M., & Machovcová, K. (2018). Burnout among university faculty: The central role of work–family conflict. *Educational Psychology*, 38(6), 800–819. <https://doi.org/10.1080/01443410.2017.1340590>

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