

Original Article

Gender/Sex Differences in the Relationship between Psychosocial Work Exposures and Work and Life Stress

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Abstract

Objectives: Stress is an important factor affecting the health of working population. While work exposures are determinants of levels of work and life stress, we do not know whether similar or different exposures are related to stress levels for men and women. This study aimed to formally examine male/female differences in the relationships between psychosocial work exposures and work and life stress in a representative sample of Canadian labour market participants.

Methods: We used data from 2012 cycle of the Canadian Community Health Survey (CCHS), a representative population-based survey conducted by Statistics Canada. The sample was restricted to employed labour force participants working 15+ hours per week ($N = 8328$, 48% female). To examine the relationship between work exposures and work and life stress, we conducted path analyses. Psychosocial work exposures included social support, job insecurity, job control, and job strain. Differences between estimates for men and women were explored using multigroup analyses, constraining paths between male and female models to be equivalent and examining the impact on change in model fit.

Results: Male/female differences were observed in the relationships between supervisor support and work stress levels as well as between job control, job insecurity, job strain, and life stress levels. Higher levels of supervisor support at work were associated with lower work stress among women, but not among men. Low job control had a direct protective effect on life stress for men but not for women,

while high job strain had a direct adverse effect on life stress among women but not among men. Higher job insecurity was more strongly associated with higher life stress among men compared with women. The relationship between work stress and life stress was similar among men and women.

Discussion: The findings of this study suggest that the relationships between psychosocial exposures and work and life stress differ for men and women. Our study also raised important questions about which work exposures are considered when assessing work stress, with level of job control not related to work stress but associated with levels of life stress among men.

Conclusion: Our study highlights the role of psychosocial work environment for both work and life stress and suggests differences in the importance of specific psychosocial work dimensions for feelings of stress among men and women, and for work stress versus life stress. Future study designs should ensure that measures are included to better disentangle the relative contribution of social and biological factors in explaining these differences among men and women.

Keywords: co-worker support; gender; job control; job insecurity; job strain; job stress; life stress; sex; supervisor support; work stress

Introduction

Stress is an important factor affecting population health. It may increase the risk of developing mental and physical health conditions including depression, cardiovascular diseases, atherosclerosis, and type 2 diabetes (Gu *et al.*, 2012; Novak *et al.*, 2013; Steptoe and Kivimäki, 2013; Slavich and Irvin, 2014). Work-related stress has been linked to the absenteeism from work (Janssens *et al.*, 2014; Heo *et al.*, 2015). Stress occurs when environmental demands are perceived as taxing or exceeding one's ability to cope (Cohen *et al.*, 2007). Work-related stress may result from workplace psychosocial exposures that are perceived by an individual as exceeding or challenging their capabilities (A. Smith, 2000).

Men and women have different types and levels of psychosocial exposures at work (Torkelson and Muhonen, 2010; Marinaccio *et al.*, 2013; Cifre *et al.*, 2015). Less explored are male/female differences in the relationships between these exposures and the experiences of stress (Note: we use the term 'male/female differences' in our paper to refer to both sex and gender differences between respondents who are coded as male/men and respondents who are coded as female/women in the given database). Studies on this topic suggest that certain workplace psychosocial exposures have a stronger impact on perceived stress among women, while others are more related to stress among men.

Low job control and high-strain work (characterized by high demands and low control) have been more strongly related to stress levels among men compared with women in some (Vermuelen and Mustard, 2000; De Bruin and Taylor, 2006), but not all studies (Evans and Steptoe, 2002; Rivera-Torres *et al.*, 2013; Gaunt and Benjamin, 2007) found that job insecurity was more

distressing for men than for women; however, other studies suggested that job insecurity could be a job stressor for women rather than men (Mauno and Kinnunen, 1999; Steptoe and Willemsen, 2004). Studies also suggested that social support at work could be more strongly related to stress among women compared with men (Vermuelen and Mustard, 2000; Rivera-Torres *et al.*, 2013).

Inconsistencies in the results of some of these studies could be attributed to the differences in study samples and measurement instruments, with outcomes ranging from perceived risk of having a work injury or illness, to broader indicators of general work stress (De Bruin and Taylor, 2006; Rivera Torres *et al.*, 2013). In addition, few studies have examined these relationships in representative labour market samples, with many studies using occupational or workplace specific groups for analysis.

Male/female differences in the importance of psychosocial work exposures to stress may be related to biological or physiological (sex) and social (gender) factors. For example, the differences among men and women in the importance of social support at work for stress levels may be related to a female advantage for empathy and in the ability to recognize other people's emotions. A 2014 review of multidisciplinary research evidence concluded that historically selective pressures have shaped females' anatomy, physiology, and neurobiology to facilitate nurturing behavior and emotional attunement, and hence their ability for prosocial and cooperative behavior (Christov-Moore *et al.*, 2014).

Taking a predominantly biological approach to explain these differences between men and women, Taylor and colleagues (2000) have suggested that a 'tend-and-befriend' response to stress may be more common in females, rather than the well-recognized 'fight-or-flight' response. Under a 'tend-and-befriend' response, people

may seek out social support in stressful situations, rather than respond with aggression. According to this model, the core component of this greater attachment-related response to stress is neuroendocrine differences between men and women, such as higher levels of oxytocin and the interplay between oxytocin and estrogen, as well as lower levels of hormones associated with physically aggressive responses to stress (such as testosterone). It should be noted that while these differences are biological, they may have evolved due to social processes such as differences in care giving roles (Taylor *et al.* 2000).

Authors have noted that women are also more likely than men to be encouraged to seek and to value acceptance in personal relationships, and these social influences may also shape their behaviors under stressful conditions (González-Morales *et al.*, 2006; Jiang and Hu, 2015). Thus, lack of social support may be associated with higher stress levels among females compared with males due to biological and social differences in stress response mechanisms.

Social mechanisms (e.g. socialization patterns) and work experiences (e.g. occupational gender segregation) play an important role in shaping the relationships between psychosocial work exposures and stress. While males were traditionally required to prioritize work over family demands, females were socialized with the view of domestic and childrearing responsibilities as primary and requiring precedence over work (Swanson *et al.*, 1998). Today women still tend to retain the primary responsibility for the majority of housework and childrearing and perform more such responsibilities compared with men (Brooker and Eakin, 2001; Bloksgaard, 2011). Self-identification with home rather than with work may lessen the effects of stressful work environments on overall life stress among women compared with men. In addition, women's disadvantage in the labour market in spite of matching or surpassing men's educational attainment levels may lessen women's expectations, commitment, and attachment to work, and hence may influence the importance of what they do at work for their stress levels (Bobbitt-Zeher, 2007; Cifre *et al.*, 2015).

This study aims to formally examine male/female differences in the relationships between psychosocial work exposures and work and life stress in a representative sample of Canadian labour market participants. The hypotheses for this study are as follows:

- (1) Low job security and low job control will be more strongly associated with higher work stress among men compared with women, while the relationship between low social support at work and higher work stress will be stronger among women compared with men.

- (2) The relationship between higher work stress and higher general life stress will be stronger among men compared with women. Together these will result in stronger indirect pathways between the psychosocial exposures of job security and job control and life stress among men compared with women.

Methods

This study used data from the 2012 Canadian Community Health Survey (CCHS). The 2012 CCHS was conducted by Statistics Canada with the objective of collecting information on the factors, influences, and processes that contribute to mental health (Statistics Canada, 2013). Using a multistage, stratified clustered sample design, the CCHS targets Canadians aged 15 and over, living in all 10 Canadian provinces. Respondents from the three Canadian territories, persons living on reserves or other Aboriginal settlements, full-time members of the Canadian Forces, and the institutionalized population are excluded. All together, these exclusions represent about 3% of the population in Canada aged 15 and older.

The household-level response rate for the 2012 CCHS was 79.8%, with a selected person response rate of 86.3%, resulting in a sample of 25 113 completed interviews. All interviews were conducted by a trained Statistics Canada interviewer, between January and December 2012. Most interviews (87%) were conducted in person.

Main outcomes: work stress and general life stress

The two main outcomes in this study were self-reported work stress as a type of stress related to work exposures, and self-reported general life stress that may result from exposures from work and those outside of work. Work stress and general life stress were assessed using single questions as follows: 'The next question is about your main job or business in the past 12 months. Would you say that most days were (not at all stressful, not very stressful, a bit stressful, quite a bit stressful, extremely stressful)?' and 'Thinking about the amount of stress in your life, would you say that most days are (not at all stressful, not very stressful, a bit stressful, quite a bit stressful, extremely stressful)?' Responses were kept on the same scale and analysed as a continuous variable, with higher scores indicating more stress. Self-reported work stress measured using the data from 2010 CCHS was found to be associated with health outcomes (e.g. Szeto and Dobson, 2013), and measurement qualities of single-item measures of psychological stress appeared to be as good as longer questionnaires to measure perceived stress (Littman *et al.*, 2006).

Main independent variables: psychosocial work exposures

The 2012 CCHS contains an abbreviated version of the job content questionnaire (JCQ). This version includes five questions on job control (e.g. 'Your job required a high level of skill', 'Your job allowed you freedom to decide how you did your job'), one question on job security ('Your job security was good'), two questions on co-worker support (e.g. 'with the people you work with were helpful in getting the job done'), and one question on supervisor support ('Your supervisor was helpful in getting the job done'). For each psychosocial work exposure, responses are added together to form a continuous measure. Models were also adjusted for measures of psychological demands (two questions) and physical exertion, although these measures were not the primary focus of our study. The abbreviated version of JCQ has demonstrated low to moderate internal consistency in previous Canadian studies (Marchand *et al.*, 2006; Wang *et al.*, 2008). Lower internal consistency can be expected when very few items are capturing broad overall concepts (Striener, 2003).

In addition to examining psychosocial work exposures as independent constructs, we also included a measure of job strain in a separate model. This variable was defined as the ratio of average scores for the two psychological demand questions, compared with the average scores for the five job control questions. Ratios above one indicate higher than average demands compared with control, and ratios below one reflect average psychological demands below average job control. This measure was included as a continuous variable. Our choice of using a ratio score, as opposed to job quartiles, was to keep this measure as a continuous score, to ensure the variations in job strain across our sample were accurately reflected in our analyses (Bennette and Vickers, 2012).

All psychosocial exposures were coded so that higher scores indicated worse psychosocial work exposures (lower control, lower social support, higher insecurity, and higher job strain).

Moderating variables: male/female

Each respondent to the CCHS identifies whether they are male or female.

Covariates

Covariates included in our analyses were respondent age, education level (grouped), hours of work per week, marital status, presence of dependent children, province of residence, smoking status, alcohol consumption, leisure time physical activity, and whether the respondent had one of the following chronic conditions, as diagnosed by

a health professional: hypertension, arthritis, back problems, migraines, asthma, diabetes, depression, or another chronic condition.

Analysis

The initial sample of respondents to the CCHS totaled 25 113, of which 9298 were aged between 20 and 64 years of age, were employed, and currently working 15 or more hours per week. Of this sample, 970 respondents (10%) had missing responses to one or more of our main exposure or outcome measures. A logistic regression analyses including age, sex, education level, work stress, and life stress (which all had complete responses) examined whether these variables were associated with the probability of having missing responses. This analysis found that younger age and higher levels of education were associated with an increased likelihood of having missing responses. After removing the sample with missing responses, we had an analytic sample of 8328 respondents.

Initial analyses examined the distribution of all measures to ensure they met skew and kurtosis benchmarks to be used as linear variables. The measure of job strain ratio displayed suboptimal skew. As a result, we truncated this scale at 1% and 99% of the sample distribution. This allowed the distribution of this measure to be normal and the retention of the original scaling of the measure.

An initial path model examined the relationship between the four main psychosocial work exposures, work stress, and life stress (see Fig. 1). In this model, standardized beta estimates were calculated to examine three main effects of interest: (i) the direct effect of each psychosocial work exposure on work stress, (ii) the effect of work stress on life stress, and (iii) the direct effect of each psychosocial work exposure on life stress (depicted in Fig. 1 as dotted lines). The total effect of each psychosocial work exposure and life stress is the sum of the direct effect of these exposures on life stress (estimate (iii) above), and the indirect effect, which is the product of effects (i) and (ii) above.

A subsequent model then examined the relationship between job strain and work stress and life stress. This model followed the same analytical approach and included the same measures as our initial model, but did not include measure of psychological demands or job control, as these psychosocial exposures were included in job strain ratio.

We then examined whether these direct, indirect, or total effect estimates differed for men and women. We did this by running a multigroup model for men and women and constraining each distinct path to be equal for men and women. The difference in model fit of this constrained model, compared with a model where paths

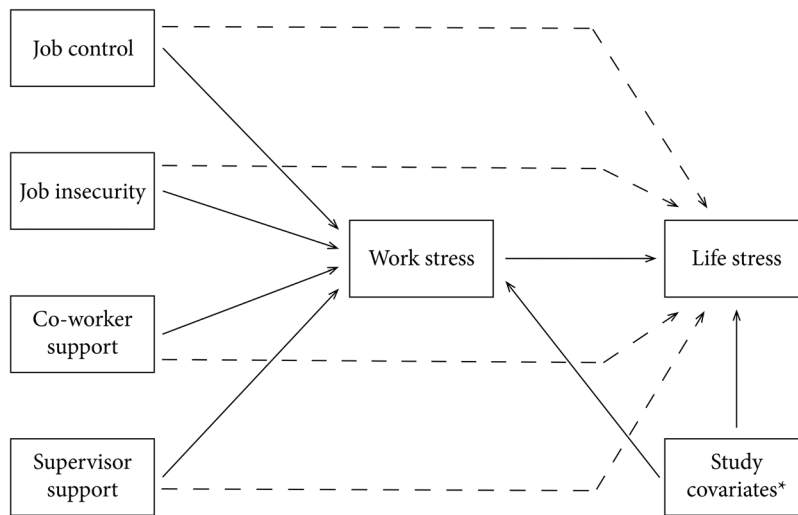


Figure 1. Outline of the main path model examining the relationship between psychosocial work exposures and work stress and life stress. All paths were also adjusted for all study covariates. *Study covariates included age, education (grouped), hours of work per week, marital status, presence of dependent children, province of residence, smoking status, alcohol consumption, leisure time physical activity, and chronic conditions.

are not constrained, provides a formal examination of the equality of a given path.

All analyses included survey weights provided by Statistics Canada to account for the initial probability of selection into the sample and non-response to the survey.

Results

Table 1 presents descriptive information on key study variables, including psychosocial work exposures and work and life stress, as well as the information on age, education, and occupational preference. Women reported higher work and life stress levels, as well as tended to have higher risk of low job control and high job strain, but higher co-worker support, compared with men. Men and women had similar levels of job insecurity and supervisor support at work in our sample.

Table 2 presents adjusted beta estimates for psychosocial work exposures and work stress for men and women. On the far-right hand side of the table is a *P*-value for the test of differences in estimates between men and women, from the comparison of the chi-square model fit with and without the particular path constrained. Among both men and women lower co-worker support, higher job insecurity, and higher job strain were associated with higher work stress. In addition, among women lower supervisor support was associated with higher work stress. Estimates for men and women only differed for the relationship between supervisor support and work stress.

Table 3 presents the adjusted beta estimates for the direct, indirect, and total effects between each psychosocial exposure and life stress, as well as between job strain and life stress. Low job control had a direct protective effect on life stress for men but not for women, while high job strain had a direct adverse effect on life stress among women but not among men. Differences were also observed between men and women for the direct relationship between job insecurity and life stress, with higher job insecurity more strongly associated with higher life stress among men compared with women. No differences were observed between men and women in the direct relationship between dimensions of social support and life stress, although a borderline significant direct effect was observed for this relationship among women but not among men. In addition, higher work stress was similarly associated with higher life stress among both men and women.

Discussion

Our study aimed to examine male/female differences in the relationships between psychosocial work exposures and work and life stress. Hypothesis 1 related to male/female differences in the relationships between job insecurity, job control, and social support, and work stress was only partially supported, with lower supervisor support being related to higher work stress levels among women, but not among men, and no other differences between men and women. Hypothesis 2 was not supported as we did not observe any difference in the

Table 1. Descriptive characteristics of study sample, stratified by gender ($N = 8328$).

	Women (%)	Men (%)	Chi-square	P-value for difference
	$n = 3986$	$n = 4342$		
Work stress				
Not at all stressful	6.5	8.7	57.3	<0.001
Not very stressful	16.8	18.6		
A bit stressful	43.2	46.1		
Quite stressful	27.1	22.4		
Extremely stressful	6.4	4.2		
Life stress				
Not at all stressful	6.0	10.3	86.0	<0.001
Not very stressful	21.4	22.0		
A bit stressful	45.4	46.9		
Quite stressful	23.1	18.4		
Extremely stressful	4.1	2.5		
Education				
Less than secondary	6.0	10.5	66.1	<0.001
Completed secondary	19.3	21.1		
Post-secondary completed	74.7	68.4		
Age group				
20 to 34	29.8	33.0	20.2	<0.001
35 to 44	25.7	25.6		
45 to 54	29.4	25.4		
55 to 64	15.1	16.0		
Psychosocial work exposures				
	Mean (SD)	Mean (SD)	T-stat	P-value
Job control (0–20)	7.1 (3.1)	6.8 (3.2)	4.77	<0.001
Job insecurity (0–4)	0.9 (1.0)	0.9 (1.0)	0.52	0.6
Co-worker support (0–8)	2.5 (1.6)	2.4 (1.5)	4.00	<0.001
Supervisor support (0–4)	1.2 (1.0)	1.1 (1.0)	1.76	0.08
Job strain ratio	0.98 (0.3)	0.91 (0.3)	9.58	<0.001

Table 2. Standardised adjusted^a beta estimates for the relationships between psychosocial work exposures, and work stress, stratified for men and women. The main model examining the exposures and the additional model of job strain ratio are presented.

Exposure	Women			Men			P-value for diff*
	Est	SE	P-value	Est	SE	P-value	
Low job control	0.000	0.011	0.97	-0.014	0.009	0.11	0.31
Job insecurity	0.076	0.023	0.001	0.082	0.026	0.002	0.88
Low co-worker support	0.085	0.017	<0.001	0.091	0.017	<0.001	0.79
Low supervisor support	0.068	0.026	0.008	-0.009	0.026	0.74	0.04
Job strain ratio	0.899	0.093	<0.001	0.800	0.099	<0.001	0.46

*P-value for difference between estimates for men compared to estimates for women.

^aAdjusted for age, education (grouped), hours of work per week, marital status, presence of dependent children, province of residence, smoking status, alcohol consumption, leisure time physical activity, and chronic conditions.

Table 3. Standardised adjusted^a beta estimates for the relationships between psychosocial work exposures and life stress, stratified for men and women. The main model examining the exposures and the additional model of job strain ratio are presented.

Exposure	Women				Men				P-value for diff
	Est	SE	P-value	% indirect/direct	Est	SE	P-value	% indirect/direct	
Low job control									
Indirect effect	0.000	0.005	0.97	0.00	-0.006	0.004	0.11	17.65	0.23
Direct effect	0.005	0.008	0.52	100.00	-0.028	0.007	<0.001	82.35	0.002
Total effect	0.005	0.010	0.61		-0.034	0.008	<0.001		0.003
Job insecurity									
Indirect effect	0.031	0.009	0.001	53.45	0.035	0.012	0.002	26.12	0.78
Direct effect	0.027	0.023	0.24	46.55	0.099	0.022	<0.001	73.88	0.02
Total effect	0.058	0.027	0.03		0.134	0.022	<0.001		0.03
Low co-worker support									
Indirect effect	0.035	0.008	<0.001	100.00	0.039	0.008	<0.001	59.09	0.66
Direct effect	0.000	0.015	1.00	0.00	0.027	0.015	0.07	40.91	0.2
Total effect	0.035	0.017	0.04		0.066	0.016	<0.001		0.17
Low supervisor support									
Indirect effect	0.028	0.011	0.01	38.89	-0.004	0.011	0.74	12.1	0.04
Direct effect	0.044	0.023	0.05	61.11	0.029	0.025	0.24	87.9	0.65
Total effect	0.072	0.024	0.003		0.025	0.024	0.28		0.17
Job strain ratio									
Indirect effect	0.373	0.046	<0.001	67.5	0.364	0.047	<0.001	77.4	0.9
Direct effect	0.180	0.077	0.02	32.5	-0.106	0.075	0.16	22.6	0.008
Total effect	0.553	0.092	<0.001		0.259	0.089	0.004		0.02
Work stress to life stress	0.408	0.028	<0.001		0.432	0.026	<0.001		0.43

^aAdjusted for age, education (grouped), hours of work per week, marital status, presence of dependent children, province of residence, smoking status, alcohol consumption, leisure time physical activity, and chronic conditions

relationship between work stress and life stress between men and women. However, we did observe differences in the direct effects of job insecurity, job control, and job strain on life stress between men and women. Higher job insecurity and higher job control were associated with higher life stress among men compared with women, while higher job strain was associated with higher life stress among women but not among men.

Our findings of male/female differences of the relationships between supervisor support and work stress levels are in line with earlier studies (Vermuelen and Mustard, 2000; Rivera-Torres *et al.*, 2013). The absence of male/female differences between co-worker support and work stress was unexpected, given that women were previously found to be more psychologically reactive to social relationships than men. Our results to some extent contradict the study by Jiang and Hu (2015) who found that the beneficial effect of colleague relationships on life satisfaction was significantly stronger among females

compared with males. Exploring contextual factors such as sources and types of social support in future studies is needed to better understand the differences in the importance of social support at work for stress levels among men and women.

Our findings of the absence of the effects of job control on work stress levels and protective effect of low job control on life stress levels among men (but not among women) contradict other studies on this topic (Vermuelen and Mustard, 2000; Griffin *et al.*, 2002; Steptoe and Willemsen, 2004; De Bruin and Taylor, 2006; Riverra-Torres, 2013; Hattori and Munakata, 2015). This may be due to the abbreviated measure used in our study, although previous studies using this abbreviated measure (albeit in different samples) have found that low job control does have a stronger impact on psychological distress (measured cross-sectionally) (Vermuelen and Mustard, 2000) and future incidence of hypertension (P. M. Smith *et al.*, 2013) among men compared with women. It is

also possible that job control on its own is not related to stress levels; rather, job strain ratio as an indicator reflecting both the psychological demands and job control may be more relevant for stress levels among men and women. In this study, although we did not observe a relationship between low job control and work stress, we did observe that job strain ratio was associated with work stress among both men and women, with higher job strain (greater demands than control) associated with higher work stress among both men and women.

The direct relationships between job strain and life stress in the additional model uncovered further male/female differences. Higher job strain was directly related to higher life stress among women but not among men, with the estimate (though not significant) of -0.106 ($P = 0.156$) suggesting a tendency towards higher job strain carrying somewhat protective effect for life stress among men. The relationship between higher job strain and life stress among women may reflect the greater domestic and childrearing tasks taken on by women compared with men (Brooker and Eakin, 2001; Bloksgaard, 2011), and the subsequent interference between higher job strain at work and these home and family responsibilities among women.

We observed that while job insecurity is similarly important for the perception of work stress among men and women, men are more likely than women to experience life stress related to high job insecurity. Increasing precariousness of work in developed countries emphasizes the importance of examining health effects of job insecurity (Arnold and Bongiovi, 2013). The differences in the attachment to work and differential importance of work for personal self-esteem among men and women may provide an explanation to these observed differences (Gaunt and Benjamin, 2007; Kelan, 2008).

Contrary to our hypothesis, we did not observe male/female differences in the relationships between work stress and life stress levels, with higher level of work stress being associated with higher level of life stress in both men and women. Potential interpretations are that (i) men may be more likely to perceive their work role as a significant source of self-esteem and attach greater importance to work experiences for their identity and (ii) women may experience life stress arising from higher work stress levels as they are more likely to feel that a stressful work interferes with fulfilling family responsibilities (Grönlund, 2007). We found no previous studies examining the relationships between work stress and general life stress. More research on this topic could uncover the relative importance of sources of life stress and the differences in their effects on stress levels among men and women. Taken together, the results of our study

invite further examination of the role of job control, job insecurity, and job strain in work and life stress levels among men and women. Examining the effects of these and other psychosocial work exposures on work stress and life stress levels is important for understanding the role of work-related factors on individual's life and well-being both inside and outside the work context.

As outlined in the introduction, male/female differences in the relationships between psychosocial exposures and work and life stress likely represent both biological and social differences between men and women (Taylor *et al.*, 2000; González-Morales *et al.*, 2006; Jiang and Hu, 2015). In an attempt to further explore the role of sex and gender factors in explaining the male/female differences observed in this study, we conducted an additional sensitivity analysis examining male/female differences in occupations with high levels of gender segregation (occupations where 70% or more participants were male, and occupations where 70% or more of participants were female). This approach to defining the concept of masculine or feminine gender follows work from Lippa and Connelly (Lippa *et al.* 1990; Lippa and Connelly, 2000). While occupational choice as a proxy measure for masculinity/femininity is more limited than using a more comprehensive index of gendered roles (e.g. Pelletier *et al.*, 2015; Juster *et al.*, 2016; Pelletier *et al.*, 2016), employment in masculine or feminine occupations is associated with other masculine or feminine gender roles such as caring for children and hours of work relative to one's partner's, with caring more for children and working fewer hours than one's partner more common among people working in feminine occupations (P. M. Smith and Koehoorn, 2016).

Our goal in conducting these analyses was to examine whether male/female differences observed in our full sample persisted, or were reduced, when the sample was restricted to participants with similar gender role levels (based on occupation title). Unfortunately, even given our large population-based sample, when restricting the sample to the most masculine or feminine occupations, we did not have adequate samples of men in feminine occupations, or women in masculine occupations [women working in male-dominant occupations ($n = 331$), and men working in female-dominant occupations ($n = 361$)]. Because of the decreased precision around point estimates in these subsamples, it was difficult to draw definitive conclusions about whether male/female differences persisted, within masculine or feminine occupations. As such, the results have not been included in the current manuscript but are available from the authors on request.

As noted by Day *et al.* (2016), while there are advantages in health research studies using large administrative

databases representative of a population, data collection tools used in these studies often lack indicators related to concepts of gender. Had the data source used for this project contained more items, in addition to occupational position, that were related to roles inside and outside of work, it may have been possible to identify larger groups of men and women with similar gender roles. Alternatively, if the CCHS contained measures that could have been used to identify important biological differences between men and women in our sample (e.g. hormonal levels), this might also have offered opportunities to better disentangle sex and gender in the male and female differences observed. Better consideration of the concepts of sex and gender in the survey design phase will enable future research to better understand the relative contributions of biological and social differences between men and women in producing male/female differences in the association between exposures and outcomes

The results of this study should be interpreted given the following strengths and limitations. This study used survey data from a large representative sample of the Canadian population (CCHS), and examined a number of important mediating variables, while adjusting for a range of potential confounders in the analytical models. However, it is possible that important confounders were omitted from our models. In addition, as suggested by [Juster et al. \(2013\)](#), age may moderate workplace stress in sex-specific ways, and including age as an independent variable could provide more knowledge about the distinct pathways of these differences among men and women. As well, we were unable to examine potentially important intersections between sex/gender and other factors such as minority status, being an immigrant or having a disability, which might form the basis of future studies in this area.

Conclusions

In conclusion, the result of this study confirmed that some psychosocial work exposures may affect the levels of work and life stress differently for men and women. Supervisor support could be more beneficial for work stress levels among women compared with men, job strain may directly affect life stress levels among women, and job insecurity may more negatively affect life stress levels of men compared with women. We observed protective effects of low job control on life stress levels among men (but not among women). In our study, the relationships between work stress and life stress levels were similar among men and women. The results of this study also suggest that certain psychosocial work exposures may have direct effects on life stress independent of work stress levels. In our study, job control was not related to

work stress but was related to life stress among men. The study also highlighted the complexity in distinguishing between sex and gender in work and health research, and the need for more methodological work on distinguishing between sex and gender in quantitative analyses broadly, and specifically in the area of work stress and health.

Declaration

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