

Relationships between Job Stress and Worker Perceived Responsibilities and Job Characteristics

CS Dewa^{1,2}, AH Thompson³, P Jacobs^{3,4}

Abstract

Background: Few studies have examined the relationship between perceived responsibilities by workers and job characteristics and experiences of stress.

Objective: To examine the relationship between job stress and work responsibilities and job characteristics.

Methods: We analyzed data from 2737 adults who were labor force participants in the province of Alberta, Canada. A logistic regression model was employed to examine factors associated with high job stress.

Results: About 18% of the studied workers considered their job as being “highly stressful.” Workers who were male, did not consider their job a career or who were highly satisfied with their jobs were significantly less likely to identify their jobs as “highly stressful.” The probability of describing a job as “highly stressful” significantly increased as workers perceived their actions have an affect on those around them or when their jobs required additional or variable hours.

Conclusions: A number of factors are associated with experiencing high work stress including being more engaged with work. This is an important finding for employers, offering insight into where interventions may be targeted.

Keywords: Stress, psychology; Mental health; Employment; Work; Workload

Introduction

Workers are increasingly exposed to stressful work environments as a result of changing work expectations including tighter deadlines, constant and almost instantaneous communication and increased production targets set with seemingly little consideration for individual workload.¹⁻³ Recently, this has been played out within a context of often unstable and shrinking resources as companies restructure.^{4,5}

Approximately, 31% of the Canadian la-

bor force experiences chronic work stress either alone or in combination with chronic physical condition and/or a psychiatric disorder.⁶ Since the groundbreaking work by Karasek and Theorell⁷ and Siegrist,⁸ copious studies have reported links among job characteristics and job strain as well as mental health problems.⁹⁻¹¹ In addition, evidence is mounting, regarding the negative impact of work stress on physical health.^{7,12,13} Moreover, the presence of chronic work stress seems to amplify effects of psychiatric disorders and chronic physical conditions on disability.⁶

¹Work and Well-being Research and Evaluation Program, Center for Addiction and Mental Health, ²Department of Psychiatry, University of Toronto, ³Institute for Health Economics, Alberta, Canada, ⁴University of Alberta, Canada



Correspondence to Carolyn S. Dewa, MPH, PhD, Program Head, Work and Well-being Research and Evaluation Program, Senior Scientist/Health Economist, Health Systems Research and Consulting Unit, Center for Addiction and Mental Health, 33 Russell Street, T319, Toronto, Ontario M5S 2S1, Canada
E-mail: carolyn_dewa@camh.net

TAKE-HOME MESSAGE

- Chronic exposure to high work stress can transform into burnout, mental disorders and disability.
- Workers with disrupted marriages and managers/professionals are more likely to identify their jobs as being associated with high stress.
- The probability of describing a job as “highly stressful” significantly increases as workers perceive their actions have an effect on co-workers, the environment and their company as well as when their jobs require additional or variable hours.
- Among those who perceive their jobs as highly stressful, there are significantly lower proportions of workers who are males, under 25 years, single/never married and who have not completed high school.

Higher odds of chronic work stress are associated with particular job characteristics.^{7,8} For example, greater autonomy relative to psychological demand and greater skill discretion are related to greater likelihood of reporting chronic work stress whereas greater social support at work is associated with lower odds of reporting chronic work stress.¹⁴

Even after controlling for the contributions of job characteristics, certain occupations are also associated with chronic job stress.¹⁴⁻¹⁶ However, results in the literature are not consistent regarding the occupations that are most exposed to job strain.¹⁴⁻¹⁸ However, it has been suggested that some of the differences could also be related to differences in commitment to the organization.¹⁷

Job characteristics also appear to have

different impacts on men and women. For example, there is a large proportion of men with depression who have high job strain whereas there is a large proportion of women with depression who have low social support in the workplace.¹⁹ Long working hours are associated with depression in women.²⁰

There is also a significant body of work examining the relationship between work satisfaction and mental health status. A recent meta-analysis based on 500 reported studies found a strong correlation between job satisfaction and mental health status.²¹

Noblet and LaMontagne²² note that “occupational stress occurs when external demands and conditions do not match a person’s needs, expectations or ideas or exceed their physical capacity, skills, or knowledge for comfortably handling a situation.” This suggests that two immediate sources of stress for workers are their working conditions and themselves. But, rather than two distinct entities, Noblet and LaMontagne²² indicate that stress is also related to the interface between the organization and the individual including considerations regarding person-environment fit and expectations. They go on to suggest that the most effective interventions address both the person and the environment.

However, there have been few studies examining the relationship between perceived responsibilities by workers and job characteristics and experiences of stress. Yet, this type of information is essential to developing effective interventions that target both the person and the environment.

In this paper, we examine the relationship between worker perceived responsibilities and job characteristics and job stress among labor force participants in the past year in the province of Alberta, Canada.

Materials and Methods

Study population

These analyses are based on responses from the 2737 adults who completed a telephone questionnaire that was administered by professional interviewers during the period from late August 2009 to late November 2009. People who were between 18 and 65 years and living in Alberta and who were in the workforce during the 12 months preceding the survey were eligible for inclusion. The overall response rate was 42.3% of those contacted, but it should be noted that it improved throughout the course of data collection, ranging from 28.8% and 27.0% for the first two weeks to 72.5% and 72.8% for the last two weeks (of thirteen). This study was approved by the Health Research Ethics Board of the Faculty of Medicine and Dentistry, University of Alberta, Canada.

Dependent variable

The dichotomous dependent variable for these analyses was created based on responses to the question, "How stressful do you consider your job?" such that a response of "2 = extremely stressful" was coded as '1' indicating "high stress" and responses of either "0 = not at all stressful" or "1 = somewhat stressful" were coded as '0' indicating "low stress."

Independent variables

Demographic characteristics: Demographic characteristics included 1) sex (male/female), age in years at the time of the interview, marital status (single/never married, married, disrupted marriage [separated, divorced or widowed]), education (did/did not complete high school), currently working (yes/no).

Occupation variables were also created

to indicate whether the respondent was in one of eight occupation groups: 1) managerial/professional, 2) proprietor, 3) clerical/office worker, 4) sales, 5) services, 6) farmer/forestry/mining, 7) manufacturing/construction/equipment handling, or 8) other.

Job/organization characteristics: Respondents were asked a series of 18 questions pertaining to job and organization characteristics. A factor analysis of these items produced five factors.²³ One of these was a one-item factor—job stress—that is being used as the dependent variable for these analyses. A second of the five factors—job value—did not produce significant associations with "job stress." However, its four component items did, but in such a way as to cancel out their composite impact. Thus, the components were used separately.

Three composite factors were used in these analyses: 1) risk of liability, 2) extra hours, 3) variability in work hours. The "risk of liability" factor is composed of six items that measured the extent to which respondents perceived their poor job performance could result in: 1) injuring self or co-workers, 2) injuring outsiders, 3) polluting the environment, 4) damaging company equipment, 5) hurting company reputation and/or 6) causing company financial loss. This factor accounted for 19.0% of the variance among the items.

The "extra hours" factor was comprised of responses to whether respondent work involved: 1) a worksite remote from home, 2) entertaining and/or being entertained and/or 3) traveling on the job. It accounted for 10.9% of the variance among items.

The "variability in work hours" factor is composed of responses to respondent engagement in: 1) being on call, 2) shift work, 3) a compressed work week and/or 4) long work hours including overtime. This factor accounted for 9.0% of item variance.

Table 1: Demographic characteristics of the studied workers

Parameter	Work High Stress n (%)	Work Not High Stress n (%)	Total n (%)	p value
Sex				
Male	165 (33.54)	912 (40.84)	1077 (39.72)	0.003
Female	327 (66.46)	1321 (59.16)	1648 (60.61)	
Age (yrs)				
≤25	32 (6.50)	222 (9.94)	254 (9.51)	0.018
26–30	28 (5.69)	174 (7.79)	202 (7.50)	0.108
31–40	112 (22.76)	503 (22.52)	615 (22.56)	0.905
41–50	160 (32.52)	650 (29.10)	810 (29.78)	0.132
51–60	130 (26.42)	551 (24.66)	681 (25.00)	0.415
≥61	30 (6.10)	134 (6.00)	164 (6.02)	0.933
Marital Status				
Single/Never married	51 (10.45)	309 (14.03)	360 (13.52)	0.036
Married/Co-habiting	354 (72.54)	1650 (74.93)	2004 (74.51)	0.272
Disrupted marriage	83 (17.01)	243 (11.04)	326 (12.56)	<0.001
Education				
Did not finish high school	12 (2.44)	105 (4.73)	117 (4.50)	0.024
Occupation				
Manager/Professional	283 (57.64)	849 (38.11)	1132 (42.99)	<0.001
Proprietor	41 (8.35)	228 (10.23)	269 (9.94)	0.206
Clerical/Office worker	28 (5.70)	251 (11.27)	279 (10.71)	<0.001
Sales	19 (3.87)	147 (6.60)	166 (6.29)	0.022
Services	70 (14.26)	415 (18.63)	485 (18.00)	0.022
Farmer/Forestry/Mining	14 (2.85)	99 (4.44)	113 (4.24)	0.110
Manufacturing/Construction/ Equipment handling	27 (5.50)	208 (9.34)	235 (8.90)	0.006
Other	9 (1.83)	31 (1.39)	40 (1.49)	0.46
Works for Small Employer	134 (27.92)	345 (72.08)	479 (59.73)	<0.001
Currently Not Working	20 (4.07)	110 (4.92)	130 (4.79)	0.42

Note: Columns do not total to 2737 due to missing data.

The decomposed “job value” variables were used to capture respondents’ ratings on its component items. The first two items were based on respondents’ rating of their work: 1) repetitive nature or 2) inherent boredom.

The third variable, “work satisfaction,” was derived from the question, “How would you rate your overall job satisfaction?” Those who indicated their satisfaction was either “very high” or “high” were coded as “being satisfied.”

The final variable was created to indicate whether respondents viewed their current position as a “job” vs a “career.” This was based on the assumption that the latter would indicate a personal investment and identification with one’s work. The former would indicate low personal investment in one’s work, seeing the job simply as a means of earning a living.

Respondents were asked, “How many people work for/in your company in Alberta?” Respondents who indicated that they worked in companies of less than 50 people were identified as working in small businesses. In Canada, about 95% of the working population are in companies with less than 50 employees.²⁴

Statistical analysis

Chi-square tests were used to examine the differences in the prevalence rates for particular characteristics for those who consider their job associated with high work stress and those who did not. A logistic regression was used to examine the association between high work stress and the individual and job/organization characteristics.

Results

The results indicate that about 18% of the sample considered their job as being associated with “high stress.” Results in Table 1 suggest that there are differences

in the prevalence among different groups. Among those who perceive their jobs as highly stressful, there are significantly lower proportions of workers who are males (34% vs 41%, $p = 0.003$), under 25 years (7% vs 10%, $p = 0.018$), single/never married (10% vs 14%, $p = 0.036$) and have not completed high school (2% vs 5%, $p = 0.024$). Workers in disrupted marriages (17% vs 11%, $p < 0.001$) and managers/professionals (58% vs 38%, $p < 0.001$) are more likely to identify their jobs as being associated with high stress.

Table 2 contains the results examining the work characteristics associated with high stress jobs. Among respondents who indicate that they have high stress work, there is a significantly greater proportion who perceive that their poor job performance has serious implications on co-workers (25% vs 12%, $p < 0.001$), the environment (11% vs 6%, $p < 0.001$) and their company profits (32% vs 17%, $p < 0.001$). There are also significant relationships between work characteristics that are related to additional work hours such as working away from home (34% vs 27%, $p = 0.003$), traveling on the job (50% vs 38%, $p < 0.001$). Variable work hours are also significantly associated with perceiving a job as being highly stressful such as being on call (45% vs 29%, $p < 0.001$) and working long work hours (80% vs 52%, $p < 0.001$).

Among those who perceive that they have high stress work, there were lower proportions of people who are satisfied with their jobs (66% vs 75%, $p < 0.001$) or who do not consider their jobs as careers (21% vs 31%, $p < 0.001$).

Table 3 contains the results of the logistic regression analysis. All else being equal, workers who are male (OR = 0.585, $p < 0.001$), do not consider their job a “career” (OR = 0.692, $p = 0.015$), are satisfied with their jobs (OR = 0.485, $p < 0.001$) or are employed in a small business (OR = 0.693, $p = 0.006$) are significantly less

Table 2: Job characteristics of “high stress” work and not “high stress” work groups

Parameter	Work High Stress n (%)	Work Not High Stress n (%)	Total n (%)	p value
Risk of Liability	140 (29.05)	345 (16.02)	485 (19.78)	<0.001
Injuring self or co-workers	123 (25.05)	269 (12.15)	392 (16.20)	<0.001
Injuring outsiders	75 (15.34)	192 (8.70)	267 (10.57)	<0.001
Polluting the environment	55 (11.29)	142 (6.43)	197 (7.79)	<0.001
Damaging company equipment	81 (16.63)	234 (10.57)	315 (12.13)	<0.001
Hurting company reputation	189 (38.73)	509 (23.05)	698 (27.30)	<0.001
Contribute to company losing money	153 (31.55)	381 (17.45)	534 (21.49)	<0.001
Extra Hours	175 (34.71)	574 (25.73)	749 (27.83)	<0.001
Worksite remote from home	168 (34.29)	614 (27.48)	782 (28.94)	0.003
Entertaining and/or being entertained	128 (26.12)	456 (20.46)	584 (21.70)	0.006
Traveling on the job	246 (50.10)	855 (38.27)	1101 (40.91)	<0.001
Variability In Work Hours	151 (31.07)	357 (16.18)	508 (20.61)	<0.001
On call	222 (45.21)	652 (29.24)	874 (33.30)	<0.001
Shift work	179 (36.53)	495 (22.20)	674 (26.01)	<0.001
Compressed work week	145 (29.71)	502 (22.63)	647 (24.22)	<0.001
Long work hours including overtime	392 (80.00)	1145 (51.53)	1537 (58.79)	<0.001
Work consists of repetitive tasks	191 (38.98)	773 (34.79)	964 (35.62)	0.079
Work is boring	356 (72.51)	1496 (67.09)	1852 (68.13)	0.020
Satisfied with work	323 (65.78)	1670 (74.96)	1993 (73.47)	<0.001
Job vs career	104 (21.22)	689 (31.09)	793 (29.80)	<0.001

Note: Columns do not total to 2737 due to missing data.

likely to identify their job as being highly stressful. The probability of describing a job as “highly stressful” significantly increases as workers perceive their actions have an effect on co-workers, the environment and their company (OR = 2.169, p<0.001) as well as when their jobs re-

quire additional (OR = 1.461, p = 0.003) or variable hours (OR = 1.997, p<0.001). The odds of perceiving that a job is highly stressful is almost doubled if a respondent had a disrupted marriage (OR = 1.980, p = 0.004) or was a manager/professional (2.193, p<0.001).

Discussion

Overall, this study indicated that about 18% of workers in Alberta experience “high work stress.” This is almost half that observed in the Canadian working population.⁶ At the same time, previous analyses have also suggested that living in one of the Canadian Prairie Provinces (*i.e.*, Alberta, Saskatchewan, Manitoba), was associated with significantly lower odds of experiencing chronic work stress.¹⁴ Furthermore, it should be noted that although low relative to the rest of the country, the figure indicates that almost one in five workers in Alberta describe their jobs as being associated with high stress. Future research should examine the relationship between the description of a job as “high stress” and productivity and health status.

It is also interesting to note that 73% of respondents indicated they were satisfied with their jobs. The fact that there appears to be significantly lower work stress in Alberta is consistent with the literature that indicates a significant relationship between job satisfaction and mental health status.²¹

Our results also indicate that a job requiring extra working hours or variable hours is associated with high work stress. These findings corroborate those that suggest workers who do not have control over their work are exposed to stress.²⁵ Our findings also may reflect the fact that a job that does not have well-defined working hours may impinge on home life. If the boundaries between work and home hours are not well-defined, work characteristics such as hours worked, job authority and non-routine work are associated with increased work-to-home conflict.²⁶ In turn, increased work-to-home conflict can increase psychological distress among workers.²⁷ This corroborates our finding that having a disrupted

Table 3: Logistic regression results: Outcome = “High Stress” work

Variable	Odds ratios	95% Confidence Interval
Male	0.585	0.452–0.758
Age	1.009	0.997–1.020
Non-white	0.795	0.534–1.186
Marital status (Reference group: single)		
Married	1.225	0.844–1.778
Disrupted marriage	1.980	1.248–3.140
Did not finish high school	0.867	0.441–1.703
Currently not working	0.738	0.414–1.313
Job versus career	0.692	0.515–0.930
Satisfied with work	0.485	0.375–0.626
Risk of liability	2.169	1.647–2.857
Extra hours	1.461	1.137–1.878
Variability in work hours	1.997	1.526–2.614
Work is boring	1.254	0.980–1.603
Occupation (Reference group: clerical/office worker)		
Manager/Professional	2.193	1.380–3.485
Proprietor	1.287	0.697–2.376
Sales	1.048	0.532–2.065
Services	1.233	0.733–2.074
Farmer	0.808	0.367–1.776
Manufacturing/Trades	0.900	0.468–1.730
Other	2.008	0.776–5.197
Employed in a small business	0.693	0.533–0.900

marriage is also associated with “high work stress.” Indeed, there is evidence that non-work factors including relationships at home could have a greater impact on psychological distress experienced by workers than workplace factors.²⁸

We also observed that perceived risk of

liability was associated with significantly higher odds of high work stress. In contrast, viewing work as a “job” vs a “career” was associated with lower stress. These results may reflect a respondent’s engagement with his/her work.²⁹ That is, respondents who identify the potential impact of their actions on outcomes for their companies or who view their work as a “career” vs a “job” are more likely to experience work pressure because there is less distance perceived between him/herself and work.

Finally, we observed that managers/professionals were at greater odds of experiencing high stress than clerical/office workers. This seems to contradict European reports indicating that those who are at relatively lower occupational status are at greater risk of sickness and sickness absence.^{16,30} This finding may reflect the economic context during which this survey was conducted. In Canada, during 2009, the unemployment rate rose by approximately 2.3%. Between 2008 and 2010, Canadian workers faced rising threats of unemployment. Job insecurity is associated with four times the odds of depression and three times the odds of anxiety.³¹ In particular, workers who are in high or mid-status positions and who have low job security are at greater risk of poor mental health.³²

Our finding may also reflect the changing workplace in which there has been a “delaying” such that layers of management have been removed resulting in a leaner organization and potentially leaving remaining middle managers with more responsibilities.³³ At the same time, the information revolution that has created greater demands to be more instantaneously responsive to inquiries.³³ Schieffman and Reid²⁷ found that professionals and people who are in positions of authority in their workplaces are more likely to be exposed to interpersonal conflicts and

work-to-home interference which are associated with greater psychological distress.

Limitations

The results reported in this paper should be interpreted in light of the data limitations. First, the measure of job stress depended on self-report. Thus, it may be subject to reporting bias. The definition of what is stressful may vary by respondent. The variation may also manifest itself if there are differences in interpretations of what is stressful among people who are in seemingly similar contexts (*i.e.*, same sex, occupation, age). Second, we used cross-sectional data and cannot make statements about causality. It may be that respondents who are experiencing high work stress may be less satisfied with their jobs. In turn, they may perceive conditions to be worse. Or, there may be confounding variables that were not captured and better explain the relationship such as personality, mental disorders or coping styles. It would be important for future research to explore the relationship of these factors to the outcome. Third, the survey sample had an over-representation of females. This could have influenced the prevalence rates that we observed. Finally, interviews were limited to people with telephones. To the extent that telephone ownership is linked to occupational class (*i.e.*, a large proportion of people who do not have telephones are members of the lowest occupational classes) and those excluded are the more dissatisfied with work or experience higher work stress, we would have overestimated the proportion of people who are satisfied with work and underestimated the proportion of workers experiencing high work stress.

In conclusion, we observed that there are a number of factors that are associated with experiencing high work stress. Among them are being a manager/profes-

sional and being more engaged with work. This is an important finding for employers; their key employees are potentially at the greatest risk of high work stress. In turn, chronic exposure to high work stress can transform into burnout,³⁴ mental disorders¹¹ and disability.⁶ This emphasizes the need for effective interventions addressing high work-related stress which can include limiting extra or variable hours.

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