

Job Strain, Depressive Symptoms, and Drinking Behavior Among Older Adults: Results From the Health and Retirement Study

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Objective. To examine the relationship between job strain and two indicators of mental health, depression and alcohol misuse, among currently employed older adults.

Method. Data come from the 2004 and 2006 waves of the Health and Retirement Study ($N = 2,902$). Multivariable logistic regression modeling was used to determine the association between job strain, indicated by the imbalance of job stress and job satisfaction, with depression and alcohol misuse.

Results. High job strain (indicated by high job stress combined with low job satisfaction) was associated with elevated depressive symptoms (odds ratio [OR] = 2.98, 95% confidence interval [CI]: 1.99–4.45) relative to low job strain after adjusting for sociodemographic characteristics, labor force status, and occupation. High job stress combined with high job satisfaction (OR = 1.93) and low job stress combined with low job satisfaction (OR = 1.94) were also associated with depressive symptoms to a lesser degree. Job strain was unrelated to either moderate or heavy drinking. These associations did not vary by gender or age.

Discussion. Job strain is associated with elevated depressive symptoms among older workers. In contrast to results from investigations of younger workers, job strain was unrelated to alcohol misuse. These findings can inform the development and implementation of workplace health promotion programs that reflect the mental health needs of the aging workforce.

Key Words: Aging workforce—Alcohol misuse—Depression—Job strain.

MORE than 16% of U.S. adults aged 65 years and older work at least part time (U.S. Bureau of Labor Statistics, 2008). That proportion is expected to rise as members of the baby boom generation show a trend of continuing to work into their mid- and late-60s (Gendell, 2008; U.S. Bureau of Labor Statistics, 2008) because changes in retirement and health benefits may encourage workers to remain in the labor force (Mermin, Johnson, & Murphy, 2007).

Although employment is generally associated with better mental health relative to other labor force groups (i.e., disabled, unemployed), occupational stress has been associated with numerous poor health outcomes, including psychological distress, alcohol misuse and abuse, and cardiovascular disease (Karasek, 1979; Ohlin, Berglund, Rosvall, & Nilsson, 2007; Stansfeld & Candy, 2006; J. L. Wang, Lesage, Schmitz, & Drapeau, 2008; Yang, Yang, & Kawachi, 2001). Several theoretical frameworks of job strain, including Karasek's (1979) demand-control model of work characterized by an imbalance of high cognitive or physical demand accompanied by low decision latitude or control over the type or pace of work, are built on the concept that occupational stress, in and of itself, is not pathogenic. Rather, it is the interaction of high levels of stress in the context of low control or reward that drives the association

with poor health (Karasek, 1979; Seigrist, 1996; Theorell & Karasek, 1996). High levels of job strain negatively influence mental health by fostering learned helplessness and impairing sense of control (Seligman, 1975; J. L. Wang, Schmitz, Dewa, & Stansfeld, 2009). However, with few notable exceptions (de Zwart, Frings-Dresen, & Duivenbooden, 1999), the majority of these reports have focused on younger adults, and it is not clear whether occupational stressors influence mental health for older workers (Power, Matthews, & Manor, 1998).

The relationship between working in later life and health status may differ from earlier in life for numerous reasons: First, working past the traditional retirement age may be indicative of financial hardship (i.e., that an individual cannot afford to retire), which itself is associated with poor mental health (Eaton, Muntaner, Bovasso, & Smith, 2001). People may also continue working in order to retain benefits tied to employment, such as health insurance (Mermin et al., 2007). Conversely, the workplace social environment may preserve health for older adults to a greater degree than for younger workers, despite exposure to occupational stressors (Carlson, Seeman, & Fried, 2000). The relationship between job strain and mental health in later life may vary across social groups. For example, men

and women have, on average, differing life course trajectories of work and expectations and experiences of retirement (Moen, 1996; Rosenfield, 1989; Szinovacz & DeViney, 1999), suggesting that the relationship between job strain and health may differ by gender. However, empirical investigations of gender differences in the influence of job strain on mental health have produced mixed results (Gadinger et al., 2009; Head, Stansfeld, & Segrist, 2004; Plaisier et al., 2007; Torkelson & Muhonen, 2004).

The two most common mental health problems in the older adult population are depression and alcohol misuse (e.g., abuse and dependency), with approximately 20% of adults older than the age of 60 years having a history of one or both of these conditions (Kessler, Berglund, & Delmer, 2005). The prevalence and incidence of these conditions varies significantly by gender, with women being twice as likely to develop depression but half as likely to misuse alcohol relative to men, even after accounting for sociodemographic characteristics such as employment and marital status (Klose & Jacobi, 2004). As a result, examining multiple domains of distress is warranted in order to arrive at a comprehensive assessment of the relationships between stress, including work-related experiences, and mental health (Rosenfield, 1989).

In order to understand the relationship between occupational stress and mental health among older workers, this study used the Health and Retirement Study (HRS) to investigate three research questions: (a) Is job strain, indicated by an imbalance of job stress and job satisfaction, associated with psychological distress among older adults as indicated by depressive symptoms and excessive alcohol use? (b) Do these associations persist after accounting for occupational characteristics and health behaviors?, and (c) Do these relationships vary by age and gender? We hypothesized that high job strain, measured by the combination of high job stress plus low job satisfaction, would be associated with elevated depressive symptoms and alcohol misuse relative to low job strain (low job stress plus high job satisfaction) and that these relationships would persist after accounting for health behaviors. We also hypothesized that these relationships would be stronger for adults working beyond typical retirement age (>65 years old) and women relative to younger workers and men, respectively.

METHOD

Sample

The HRS is a nationally representative prospective cohort of U.S. adults older than the age of 50 years that has been under study since 1992 (National Institute on Aging, 2007). Details of the survey design have been discussed elsewhere (Juster & Suzman, 1995). This analysis is restricted to employed HRS respondents who completed items on occupational stress and satisfaction in the *Psycho-*

social Leave-Behind Questionnaire from either the 2004 or 2006 waves (it was not administered in earlier waves). This self-administered questionnaire was given to a random subset of 4,000 of HRS respondents in 2004 who completed in-person interviews as an initial pilot, and in 2006, the questionnaire was given to all respondents who completed in-person household interviews (Clarke & Fisher, 2007). The response rates for the questionnaire, after accounting for the response to the overall survey, were 68.3% in 2004 and 74% in 2006.

Only currently employed participants (full time, part time, or partially retired) completed the items on occupational stress and satisfaction: 1,147 in 2004 (89.7% of employed respondents eligible for the *Psychosocial Leave-Behind Questionnaire*) and 2,367 in 2006 (79.0% of eligible employed participants). Because only a small portion of employed respondents received the questionnaire in 2004, for this cross-sectional analysis, these two sets of data were combined. If a participant had valid measures of occupational stress at both the 2004 and the 2006 interviews ($N = 410$), only the 2004 data were used. We conducted two sensitivity analyses to assess the impact of this decision: First, we took only the 2006 data for those with valid data at both waves, and second, we excluded those participants who had data at both 2004 and 2006, and results were similar (see Supplementary Materials). In total, 2,902 respondents employed in either 2004 or 2006 had valid data on the measures of occupational stress, occupational satisfaction, and relevant covariates. Respondents missing data on these measures were older ($\chi^2 = 13.92, p < .001$), less educated ($\chi^2 = 4.44, p = .035$), less likely to be White ($\chi^2 = 51.23, p < .001$), and less likely to be working full time ($\chi^2 = 19.71, p < .001$) than those with complete data. There were no differences in terms of gender ($\chi^2 = 0.001, p = .973$) or occupation ($\chi^2 = 4.94, p = .085$).

The HRS was approved by the Institutional Review Board at the University of Michigan, and all participants provided informed consent.

Independent Variable

Job stress and job satisfaction was assessed in the *Psychosocial Leave-Behind Questionnaire* using 15-item index derived from Karasek's job strain scale (Karasek, 1998). Participants were asked to rate on a 4-point Likert scale to what degree each statement described their current job (e.g., *I receive the recognition I deserve for my work; I have very little freedom to decide how I do my work*). These 15-items describe two factors: job stress (6 items, $\alpha = .80$) and job satisfaction (9 items, $\alpha = .75$; Clarke & Fisher, 2007). The item scores that describe each factor were averaged to produce an overall score for both stress and satisfaction, each having a range of 1–4, with higher values indicating higher levels of job stress or job satisfaction, respectively. In order to examine the combination of job stress and satisfaction,

these two scales were dichotomized at the median (indicating high/low job stress and high/low job satisfaction). We developed a categorical measure of job strain based on the demand–control and effort–reward imbalance models put forth by Karasek (1979) and Seigrist (1996) in which they outline the conceptual basis for combining positive (e.g., job satisfaction) and negative (e.g., job stress) aspects of work into a single aggregate variable for analysis. Following these models, we created a job strain measure that reflects the confluence of stress and satisfaction in a single four-level variable (e.g., low stress/high satisfaction [which served as the reference group for all analytic comparisons], low stress/low satisfaction, high stress/high satisfaction, and high stress/low satisfaction). We conducted post hoc sensitivity analyses to assess the influence of this categorization approach by examining job stress and satisfaction as continuous indicators as well, and the results were consistent with the findings presented here.

Dependent Variables

Depressive symptoms.—Depressive symptoms over the past week were assessed using the 8-item Centers for Epidemiologic Research Depression (Center for Epidemiological Studies-Depression scale [CES-D]) scale. The CES-D has been widely used in studies of late-life depression and has good psychometric properties for use with older populations (Steffick, 2000; Vernon & Roberts, 1983). Participants were asked to report whether they had experienced eight specific symptoms for much of the past week (e.g., *I felt depressed; I felt everything I did was an effort; My sleep was restless*). The total number of endorsed symptoms was summed to create a total depressive symptom score ranging from 0 to 8. Respondents missing two or more items were excluded from the analyses ($N = 76$). We classified those who reported four or more depressive symptoms as having significant depressive symptoms, a cutoff that produces comparable results to the 16-symptom cutoff for the 20-item CES-D scale (Steffick, 2000).

Drinking behavior.—In order to assess alcohol intake, participants were asked about their typical alcohol consumption in the past few months (e.g., *In the last three months, on average, how many days per week have you had any alcohol to drink? On the days that you drink, about how many drinks do you have?*). From this item, two dichotomous measures of alcohol misuse were constructed: moderate drinking (defined as consuming an average of two or more drinks per day for men and an average of one or more drinks per day for women; Nelson, Naimi, Brewer, & Nelson, 2009) and heavy drinking (defined as five or more drinks on a single occasion; Wechsler & Nelson, 2001). These categories are consistent with the U.S. Department of Agriculture nutritional guidelines (Naimi et al., 2003) and

with clinical recommendations for older adults to restrict alcohol use (Dufour, Archer, & Gordis, 1992). For both of these measures, the reference category was current drinkers who consume, on average, less than two drinks per day for men and, on average, less than one drink per day for women. We limited our analysis of alcohol misuse to current drinkers for three reasons: (a) nondrinkers, particularly in later life, are a heterogeneous group comprising life-long abstainers and persons who became abstinent in response to medical or other health concerns (including a history of problem drinking; Moos, Schutte, Brennan, & Moos, 2004), (b) the heterogeneity of this nondrinker group makes it difficult to interpret as a reference group, and (c) only current drinkers are at risk for alcohol use problems. We subsequently conducted additional analyses including nondrinkers to assess the impact of this on the results.

Covariates.—Potential confounders to include in the multiple regression models were identified based on prior research on the relationship between stress and mental health, and in the interest of parsimony, only those confounders who were also associated (at the level of $p < .20$ or less) with either depression or alcohol use in univariate analyses were included in the final models. Demographic characteristics included age (dichotomized as older than 65 years vs. 50–65 years to reflect Medicare age eligibility), gender, race/ethnicity (categorized as White, Black, and Hispanic), marital status (categorized as married, separated/divorced, widowed, or never married), and educational attainment (dichotomized as high-school education or less vs. at least some college). Socioeconomic position was indicated by net worth (calculated by subtracting total debt from total assets), standardized according to the sample mean. Labor force status was categorized according to the RAND criteria (St. Clair et al., 2009), indicated as full time, part time, or partly retired. Occupation was categorized as blue collar (e.g., farming, machine operators, construction, and similar trade occupations), service related (e.g., security, cleaning, food preparation, health, and personal service occupations), or white collar (e.g., management, professional specialists, sales, and administrative occupations). Tenure (in years) at current job was also assessed. Smoking status was assessed by self-report and categorized as never, former, and current. For the analyses examining depression, we included number of alcoholic drinks per week as a covariate, categorized as none, 1–7, and 8 or more. For the analyses examining alcohol misuse, we included depression status as a covariate, dichotomized as described earlier.

Statistical Analysis

We fit regression models for each of the three dichotomous outcomes: depression, moderate drinking, and heavy drinking. Initially, the association between job strain with depression and alcohol misuse was investigated using

bivariate (unadjusted) logistic regression models. Next, we conducted a series of nested logistic regression models to assess the relationship between job strain and presence of depression and alcohol misuse. Each base model was adjusted for age, race, gender, and marital status. Step 2 additionally adjusted for indicators of socioeconomic position: education, labor force status, type of work, and net worth. Finally, in Step 3, we adjusted for behavioral factors: smoking status, alcohol intake (depression model only), and depression status (alcohol misuse models only). We assessed whether the relationships between job strain varied by age group and gender using stratified models and interaction terms.

In order to assess potential bias due to the Healthy Worker Survivor effect in which bias can be introduced through the selective attrition of workers in poor health (Arrighi & Hertz-Picciotto, 1994; Pearce, Checkoway, & Kriebel, 2007), we also ran the analysis restricting the sample to those who had worked at their current job for at least five years. This approach is recommended as a means of accounting for survivor bias in occupational epidemiologic studies (Li & Sung, 1999).

We performed all analyses using SAS (version 9.2), and all *p* values refer to two-tailed tests.

RESULTS

Overall, the sample reported moderately high job satisfaction ($M = 2.88$, $SD = 0.48$) and moderate job stress ($M = 2.09$, $SD = 0.55$). Reports of job stress and satisfaction differed significantly by age, gender, marital status, educational attainment, labor force status, and type of work (Table 1). Older workers were more likely to report low job stress, regardless of job satisfaction, than younger workers ($\chi^2 = 47.75$, $p < .001$). Women were marginally more likely to report low job stress/low job satisfaction relative to men ($\chi^2 = 6.78$, $p = .0791$). Those in the high job strain category (high job stress/low job satisfaction; $N = 1,039$) were more likely to be employed full time (77.6%), working in a blue-collar occupation (28.0%), and had lower net worth relative to workers in the other job stress/satisfaction categories. Job stress and job satisfaction did not vary by race or smoking status. Participants who reported more depressive symptoms were more likely to be in the high job strain category ($\chi^2 = 122.28$, $p < .001$). There was no difference in reports of job stress or job satisfaction and moderate or heavy drinking ($\chi^2 = 2.11$, $p = .550$ and $\chi^2 = 1.56$, $p = .668$, respectively).

In bivariate logistic regression analyses, the continuous measure of job stress was significantly associated with elevated depressive symptoms (odds ratio [OR]: 1.92, 95% confidence interval [CI]: 1.46–2.50, $p < .001$) but unrelated to alcohol misuse (OR: 0.93, 95% CI: 0.68–1.26, $p = .621$ for moderate drinking and OR: 1.26, 95% CI: 0.78–2.04, $p = .342$ for heavy drinking). Results were similar for the

continuous measure of job satisfaction (OR: 0.45, 95% CI: 0.33–0.60, $p < .001$ for depression; OR: 0.77, 95% CI: 0.55–1.09, $p = .145$ for moderate drinking; and OR: 0.98, 95% CI: 0.57–1.68, $p = .946$ for heavy drinking). The categorical model of job strain that combined these two constructs further elucidated their relation to mental health. As shown in Table 2, the high levels of job strain were significantly associated with high depressive symptoms, an association that persisted after accounting for demographic characteristics, net worth, labor force status, occupation, and health behaviors. In the fully adjusted model, participants in the high job strain category (high job stress/low job satisfaction) had approximately three times the odds of high depressive symptoms relative to those in the low job strain (low job stress/high satisfaction) category (OR: 2.98, 95% CI: 1.99–4.45). Those in the high stress/high satisfaction category had lower, but still significantly elevated, risk of depression (OR: 1.93, 95% CI: 1.16–3.21) relative to the low stress/high satisfaction category. Finally, low job stress/low job satisfaction was associated with modestly elevated risk of depression (OR: 1.94, 95% CI: 1.23–3.05) relative to low stress/high satisfaction. Post hoc analyses of the relationship between job strain and the continuous measure of depressive symptoms were consistent with these findings, indicating that high job strain was associated with 0.68-point increase (95% CI: 0.53–0.83) in depressive symptoms relative to low job stress/high job satisfaction. Interaction terms between job strain and age group (≤ 65 vs. > 65 years; $p = .363$) and gender ($p = .351$) were not significant and indicated that these relationships were similar for younger and older workers and for women and men.

As shown in Table 3, there was no relationship between job strain and moderate drinking among those who drink in either the bivariate or fully adjusted models. Persons with white-collar occupations were less likely to be heavy drinkers relative to persons with blue-collar occupations. Similar results were observed for the heavy drinking outcome (see Supplementary Table 1). There was no evidence of moderation by age group or gender. Additional analyses including nondrinkers in these models produced similar results.

The analysis described earlier was restricted to adults who are currently employed, and thus, the potential bias introduced by the health worker survivor effect would be observed not from sicker workers exiting the labor force but rather from sicker workers leaving higher strain jobs for lower strain jobs. To address this potential bias, we further restricted the sample to workers who had been at their current job (in 2004/2006) for at least five years ($N = 1,765$), and these analyses produced similar results (see Supplementary Tables 2–3). Both the high job strain (OR: 2.24, $p = .001$) and low job stress/low job satisfaction (OR: 1.76, $p = .05$) categories were significantly associated with elevated depressive symptoms in the fully adjusted model. High job stress/high job satisfaction was not significantly associated with depression in this restricted sample (OR:

Table 1. Respondent Characteristics by Strata of Job Strain, the Health and Retirement Study 2004/2006

	Overall	Job strain						χ^2 or <i>F</i> value
		Stress below median			Stress above median			
		Satisfaction above	Satisfaction below	N	Satisfaction above	Satisfaction below	N	
<i>N</i>	2,902	858	621	386	1,037			
Age (<i>M, SD</i>)	60.42 (7.14)	61.96 (7.28)	61.9 (7.43)	59.06 (6.49)	58.76 (6.59)		47.86*** 2.54	
Race								
White	2,374 (81.81)	708 (82.52)	496 (79.87)	315 (81.61)	855 (82.45)			
Black	307 (10.58)	88 (10.26)	75 (12.08)	41 (10.62)	103 (9.93)			
Hispanic	221 (7.62)	62 (7.23)	50 (8.05)	30 (7.77)	79 (7.62)			
Women	1,553 (53.51)	455 (53.03)	360 (57.97)	204 (52.85)	534 (51.49)		6.81 20.77*	
Marital status								
Married/partnered	2,190 (75.47)	665 (77.51)	444 (71.50)	302 (78.24)	779 (75.12)			
Separated/divorced	394 (13.58)	96 (11.19)	92 (14.81)	47 (12.18)	159 (15.33)			
Widowed	225 (7.75)	67 (7.81)	66 (10.63)	28 (7.25)	64 (6.17)			
Never married	93 (3.20)	30 (3.50)	19 (3.06)	9 (2.33)	35 (3.38)			
Educational attainment								
High school or less	1,251 (43.11)	329 (38.34)	292 (47.02)	148 (38.34)	482 (46.48)		20.20***	
At least some college	1,651 (56.89)	529 (61.66)	329 (52.98)	238 (61.66)	555 (53.52)		189.08***	
Labor force status								
Full time	1,950 (67.20)	511 (59.56)	338 (54.43)	296 (76.68)	805 (77.63)			
Part time	375 (12.92)	94 (10.96)	102 (16.43)	48 (12.44)	131 (12.63)			
Partly retired	577 (19.88)	253 (29.49)	181 (29.15)	42 (10.88)	101 (9.74)			
Type of work								
Blue collar	603 (20.78)	136 (15.85)	96 (15.46)	81 (20.98)	290 (27.97)		65.08***	
Service related	465 (16.02)	128 (14.92)	118 (19.00)	51 (13.21)	168 (16.20)			
White collar	1,834 (63.20)	594 (69.23)	407 (65.54)	254 (65.80)	579 (55.83)			
Net worth (<i>M, SD</i>)	553,384.59 (2,300,000)	765,914.83 (3,130,000)	549,741.88 (3,090,000)	548,497.25 (1,150,000)	381,540.51 (695,000)		4.37** 9.94	
Smoking status								
Never	1,287 (44.35)	378 (44.06)	267 (43.00)	181 (46.89)	461 (44.46)			
Former	1,167 (40.21)	369 (43.01)	253 (40.74)	148 (38.34)	397 (38.28)			
Current	448 (15.44)	111 (12.94)	101 (16.26)	57 (14.77)	179 (17.26)		16.56*	
Average number of alcoholic drinks consumed per week								
None	1,703 (58.68)	462 (53.85)	375 (60.39)	229 (59.33)	637 (61.43)			
1-7	835 (28.77)	281 (32.75)	158 (25.44)	113 (29.27)	283 (27.29)			
8+	364 (12.54)	115 (13.40)	88 (14.17)	44 (11.40)	117 (11.28)			
Moderate alcohol consumption	215 (7.41)	65 (7.58)	52 (8.37)	23 (5.96)	75 (7.23)		2.11	
Heavy alcohol consumption	77 (2.65)	18 (2.10)	17 (2.74)	11 (2.85)	31 (2.99)		1.55 123.40***	
Depressive symptoms								
None	1,575 (54.27)	577 (67.25)	347 (55.88)	201 (52.07)	450 (43.39)			
1-3 symptoms	1,072 (36.94)	247 (28.79)	221 (35.59)	153 (39.64)	451 (43.49)			
4 or more symptoms	255 (8.79)	34 (3.96)	53 (8.53)	32 (8.29)	136 (13.11)			
Job strain indices (<i>M, SD</i>)								
Job satisfaction	2.87 (0.48)	3.34 (0.29)	2.65 (0.27)	3.22 (0.23)	2.50 (0.35)		1,462.52***	
Job stress	2.07 (0.55)	1.58 (0.32)	1.73 (0.29)	2.45 (0.30)	2.54 (0.35)		1,827.66***	

Notes: Values are *N* (%) unless otherwise noted. Job strain refers to the four-level indicator of imbalance of job stress and job satisfaction. Moderate alcohol use is defined as consuming an average of two or more drinks per day for men, and an average of 1 or more drinks per day for women. Heavy alcohol use defined as five or more drinks on a single occasion for both men and women.

p* < .05; *p* < .01; ****p* < .001.

Table 2. Logistic Regression of the Association Between Job Strain and Depression Status

Independent variables	Model 1	Model 2	Model 3	Model 4
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Job strain (ref. low job stress and high job satisfaction)				
Low job stress and low job satisfaction	2.26 (1.45, 3.52)	2.08 (1.33, 3.26)	1.97 (1.25, 3.09)	1.93 (1.23, 3.04)
High job stress and high job satisfaction	2.19 (1.33, 3.61)	2.04 (1.23, 3.37)	1.93 (1.16, 3.21)	1.92 (1.15, 3.19)
High job stress and low job satisfaction	3.66 (2.48, 5.39)	3.43 (2.31, 5.08)	2.98 (1.99, 4.44)	2.97 (1.99, 4.44)
Age (ref. ≤65 years)				
>65 years old		0.55 (0.37, 0.81)	0.57 (0.38, 0.86)	0.59 (0.39, 0.89)
Race (ref. white)				
Black		1.47 (1.00, 2.16)	1.31 (0.88, 1.95)	1.32 (0.89, 1.96)
Hispanic		2.04 (1.36, 3.06)	1.71 (1.13, 2.59)	1.85 (1.22, 2.83)
Gender (ref. women)				
Men		0.76 (0.58, 1.01)	0.68 (0.50, 0.93)	0.67 (0.49, 0.93)
Marital status (ref. married)				
Separated/divorced		1.85 (1.32, 2.60)	1.75 (1.24, 2.47)	1.73 (1.22, 2.44)
Widowed		2.41 (1.56, 3.74)	2.18 (1.40, 3.39)	2.14 (1.37, 3.34)
Never married		0.97 (0.44, 2.15)	0.92 (0.41, 2.06)	0.92 (0.41, 2.05)
Education (ref. high school or less)				
At least some college			0.84 (0.62, 1.12)	0.86 (0.64, 1.16)
Labor force status (ref. full time)				
Part time			1.29 (0.89, 1.87)	1.29 (0.89, 1.88)
Partly retired			0.86 (0.55, 1.35)	0.88 (0.56, 1.37)
Type of work (ref. blue collar)				
Service related			0.69 (0.45, 1.06)	0.67 (0.44, 1.04)
White collar			0.62 (0.43, 0.90)	0.65 (0.45, 0.93)
Standardized net worth			0.45 (0.21, 0.95)	0.51 (0.24, 1.06)
Smoking status (ref. never)				
Former				0.96 (0.71, 1.31)
Current				1.38 (0.96, 1.98)
Alcoholic drinks/week (ref. none)				
1–7				0.71 (0.51, 0.99)
≥8				1.12 (0.74, 1.70)

Notes: Model 1: unadjusted. Model 2: adjusted for age, race, sex, and marital status. Model 3: adjusted for Model 2 plus education, labor force status, type of work, and net worth. Model 4: adjusted for Model 3 plus smoking status and alcohol use. *N* for all models: 2,902. CI = confidence interval; OR = odds ratio.

1.33, $p = .394$), suggesting that the healthy survivor effect was largely restricted to workers with high job satisfaction. Consistent with Table 3, there was no relationship between job strain and moderate drinking (e.g., OR: 1.12, $p = .662$ for high job strain) or heavy drinking.

DISCUSSION

The primary finding from this study is that high job strain, indicated by the combination of high job stress with low job satisfaction, is significantly associated with likelihood of elevated depressive symptoms among older workers relative to low stress plus high satisfaction. This relationship persisted after accounting for labor force participation and occupational characteristics, socioeconomic position, and health behaviors. This association between high job strain and depression was present for both men and women and persisted across age groups. Work characterized by high job stress/high job satisfaction or low job stress/low job satisfaction was also associated with depressive symptoms, although these relationships were more modest. To the best of our knowledge, this is one of the first study to indicate that job strain is related to mental health among a nationally representative sample of older workers.

We did not find an association between job strain with alcohol misuse, which contrasts with studies of younger workers (Hemmingsson, 1998; Kouvonen et al., 2005; Yang et al., 2001). Part of this discrepancy may be that drinking behavior declines with age (Moos et al., 2004), and older adults may be less likely than younger adults to use alcohol to cope with stressors such as job strain (Holahan, Moos, Holahan, Cronkite, & Randall 2001) and may be at risk of adverse effects of alcohol due to interactions with medications or other medical counterindications for alcohol use (Moore, Whiteman, & Ward, 2007). It may be that workers who drink excessively in response to occupational stress may exit the labor force earlier than those who do not (Mullahy & Sinclair, 1993) and thus would not be represented in our cross-sectional analysis due to differential selection. Prospective studies are needed to better understand how the relationships between job strain, depressive symptoms, and alcohol use evolve over time among older workers. Future research should also explore the influence of cognitive functioning and impairment on both the experience and reporting of job stress as it relates to depressive symptoms and alcohol use among older workers.

The finding that high job strain is associated with elevated depressive symptoms is consistent with results from

Table 3. Logistic Regression of the Association Between Job Strain and Moderate Alcohol Use

Independent variables	Model 1	Model 2	Model 3	Model 4
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Job strain (ref. low job stress and high job satisfaction)				
Low job stress and low job satisfaction	1.37 (0.91, 2.05)	1.34 (0.89, 2.02)	1.31 (0.86, 1.99)	1.26 (0.83, 1.93)
High job stress and high job satisfaction	0.87 (0.52, 1.46)	0.84 (0.50, 1.41)	0.83 (0.49, 1.41)	0.87 (0.51, 1.48)
High job stress and low job satisfaction	1.18 (0.82, 1.69)	1.08 (0.74, 1.56)	0.98 (0.67, 1.45)	0.96 (0.64, 1.42)
Age (ref. ≤ 65 years)				
>65 years old		0.54 (0.34, 0.84)	0.49 (0.30, 0.80)	0.51 (0.31, 0.84)
Race (ref. white)				
Black		0.70 (0.37, 1.34)	0.56 (0.29, 1.10)	0.52 (0.26, 1.02)
Hispanic		0.55 (0.27, 1.13)	0.45 (0.22, 0.93)	0.46 (0.22, 0.97)
Gender (ref. women)				
Men		0.70 (0.51, 0.95)	0.61 (0.43, 0.86)	0.60 (0.42, 0.85)
Marital status (ref. married)				
Separated/divorced		1.03 (0.67, 1.58)	1.05 (0.68, 1.63)	0.96 (0.61, 1.50)
Widowed		1.04 (0.53, 2.04)	0.97 (0.49, 1.92)	0.87 (0.43, 1.75)
Never married		1.17 (0.50, 2.75)	1.09 (0.45, 2.61)	1.06 (0.43, 2.57)
Education (ref. high school or less)				
At least some college			0.84 (0.60, 1.17)	0.91 (0.65, 1.28)
Labor force status (ref. full time)				
Part time			1.30 (0.83, 2.03)	1.35 (0.86, 2.13)
Partly retired			1.10 (0.70, 1.73)	1.15 (0.72, 1.83)
Type of work (ref. blue collar)				
Service related			1.03 (0.59, 1.80)	1.04 (0.59, 1.82)
White collar			0.52 (0.34, 0.80)	0.58 (0.38, 0.90)
Standardized net worth			1.00 (0.87, 1.16)	1.03 (0.90, 1.17)
Smoking status (ref. never)				
Former				1.65 (1.14, 2.38)
Current				2.88 (1.86, 4.45)
Depressive symptoms (ref. 0–3)				
4+				1.58 (0.92, 2.71)

Notes: Model 1: unadjusted. Model 2: adjusted for age, race, sex and marital status. Model 3: adjusted for Model 2 plus education, labor force status, type of work, and net worth. Model 4: adjusted for Model 3 plus smoking status and depression. Moderate alcohol use is defined as consuming an average of two or more drinks per day for men and an average of one or more drinks per day for women. Models restricted to respondents who currently use alcohol ($N = 1,199$). CI = confidence interval; OR = odds ratio.

samples of younger workers, which suggests that occupational strain negatively influences mental health (Karasek, 1979; Marchand, Demers, & Durand, 2005; Marchand, Demers, Durand, & Simard, 2003). Employment in later life is often characterized by a series of bridge jobs in which older workers gradually transition to full retirement (Feldman, 1994; Gallo et al., 2006), and these bridge jobs may pose challenges to older workers in terms of requiring new occupational skills or disrupting social networks (Rix, 1996). Alternatively, workers may persist in the same job until retirement but due to increasing functional limitations (e.g., onset of chronic health problems) may find the requirements of this work increasingly burdensome. Finally, working past traditional retirement age may indicate financial insecurity, which in turn is associated with poor mental health (Eaton et al., 2001); however, the association between job strain and depression persisted after accounting for net worth. It is important to note that working past traditional retirement age may also have positive influences on health, particularly if the job is satisfying; for example, participation in volunteer programs such as Experience Corps, has been associated with improvements in executive functioning among older adults (Carlson et al. 2008).

These results should be interpreted in light of study limitations. As with all cross-sectional analyses, we cannot determine the causal nature of the relationships we observed. The relationship between depression and job strain is likely bidirectional as depressive symptoms, and health status more generally, may influence workers' reports or experiences of job stress and satisfaction (Wang et al., 2009). Longitudinal studies with repeated measures of stress and satisfaction are needed to address the predictive nature of this relationship. Also, although the CES-D is a reliable measure of current depressive symptoms, assessment via diagnostic instruments or clinical interviews is needed to confirm whether the cases of elevated depressive symptoms identified here meet diagnostic criteria for depression. All variables were assessed via self-report questionnaire and thus may be subject to reporting or information bias. In particular, the null findings regarding alcohol use may have been influenced by respondents' unwillingness or inability to accurately disclose their amount of consumption. By restricting the analysis to currently employed older adults, our sample does not include information on workers who have already exited the labor force (Christ et al. 2007). However, the sensitivity analysis

restricting the sample to workers with a tenure of at least five years at their current job produced similar results, suggesting that this selection out of the workforce did not substantially bias our results. Future research should explicitly examine the role of selection into and out of jobs characterized by high levels of job strain on risk of depression. The impact of selection bias is also mitigated by the high response rates to the job stress and job satisfaction measures among eligible respondents. This study also has several strengths, in particular, the use of a nationally representative sample of older working adults, which enhances the generalizability of the findings, and the investigation of the relationship between job strain with multiple mental health outcomes.

These findings have implications for the workplace as it becomes more common for employees to work into their sixth and seventh decade of life (Mermin et al., 2007; Rix, 1996). It is estimated that depression in the workplace costs employers over \$83 billion in 2000, primarily due to lost productivity (Greenberg et al., 2003). Use of Employee Assistance Programs (EAP) can reduce depressive symptoms, particularly suicidal ideations (Nakao, Nishikitani, Shima, & Yano, 2007), and increase the likelihood that workers will receive appropriate treatment for depression and alcohol misuse (Zarkin, Bray, & Qi, 2000). Employers should institute policies that promote awareness and acceptance of mental health conditions such as depression in the workplace, consider adopting EAPs or similar wellness programs, evaluate means to modify job performance to reduce job strain (e.g., revising timetables for projects, promoting dialogue between supervisors and employees, fostering work-life balance; Wang, Schmitz, Smailes, Sareen, & Patten, 2010), and acknowledge the reciprocal relationships between stress in the workplace and depression.

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SUPPLEMENTARY MATERIAL

Supplementary materials and tables 1–3 can be found at: <http://psychogerontology.oxfordjournals.org/>

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