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# Contribution of Burnout to the Association Between Job Strain and Depression: the Health 2000 Study

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## Learning Objectives

- Define job burnout as measured by the Maslach Burnout Inventory, and list its correlates in this survey of 3270 Finnish employees covering the full range of occupations.
- Outline relationships among job strain (measured by the Job Content Questionnaire), active versus passive work, job burnout, and depressive symptoms/disorders as estimated using the Beck Depression Inventory.
- Compare the strength of associations between job strain on the one hand and, on the other, depressive symptoms and depressive disorders with respect to the significance of job burnout.

## Abstract

**Objective:** The objective of this study was to investigate the contribution of burnout to the association between job strain and depression. **Methods:** A representative sample of 3270 Finnish employees aged 30 to 64 years responded to the Maslach Burnout Inventory–General Survey and the Beck Depression Inventory and participated in the Composite International Diagnostic Interview. **Results:** High strain compared with low strain was associated with 7.4 (95% confidence interval [CI] = 5.6–9.7) times higher odds of burnout, 3.8 (95% CI = 2.8–5.1) times higher odds of depressive symptoms, and 1.7 (95% CI = 1.1–2.6) times higher odds of depressive disorders. The risk for depressive symptoms and for depressive disorders of high strain was reduced by 69% or more after adjusting for burnout. **Conclusion:** Burnout is strongly related to job strain and may in part mediate the association between job strain and depression. (J Occup Environ Med. 2006;48:1023–1030)

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The term “burnout” was first introduced over 3 decades ago,<sup>1</sup> but it still remains an issue of much conceptual controversy. Burnout is assumed to be an outcome of chronic stress and is defined as a state of exhaustion combined with doubts about the value of one’s own work and competence.<sup>2</sup> Instead of representing a mental disorder, burnout is considered a psychologic construct that can, in clinical context, be coded as a factor that influences health status.<sup>3</sup> However, burnout and depression have been shown to be strongly related,<sup>4,5</sup> and this relationship raises the question of conceptual overlap and redundancy.

A fundamental distinction between the concepts is that burnout is supposedly work-related, whereas depression is expected to be more pervasive in nature and multifactorial in origin.<sup>6</sup> However, these assumptions have not been definitely confirmed with empiric research. In a Dutch study, lack of reciprocity in the occupational domain was associated with an increased risk of burnout, whereas lack of reciprocity in intimate relationships outside of work was associated with depressive symptoms.<sup>6</sup> However, this evidence was related to a small sample ( $n = 154$ ) comprised of only one occupational group. Moreover, the measurements did not cover exposure to work stress as indicated by the leading work stress models.<sup>7,8</sup>

Genetic factors, personality, and both the past and present psychosocial environment affect the development of

major depression interactively.<sup>9,10</sup> In the psychiatric literature, common risk factors of depressive disorders have included, for example, female gender, unmarried status, low socioeconomic position, presence of physical illnesses, previous mental disorders, absence of social support, and negative stressful life events,<sup>11,12</sup> that is, factors that do not directly indicate work characteristics. However, recent findings suggest that stressful psychosocial characteristics at work may also influence the mental health of employees.<sup>13–19</sup> The job strain model<sup>7</sup> is the most widely used conceptualization of adverse work stress in occupational health research. The dimensions of this model, psychologic job demands and job control, and especially the combination of high demands and low control, called job strain, have predicted serious health consequences.<sup>20–22</sup> High job demands and low job control have also predicted burnout<sup>23,24</sup> and psychiatric morbidity,<sup>17,25–28</sup> but, to our knowledge, not within the same study.

In this study, we examined whether job strain is related to burnout and depression in a large representative population sample covering the full range of occupations. Given the assumption that burnout is work-related and depression can develop in various areas of life, we hypothesized that job strain would be more strongly associated with burnout than with depression and that burnout would mediate the association between job strain and depression.

## Materials and Methods

### Population and Design

A multidisciplinary epidemiologic health survey, the Health 2000 Study, was carried out in 2000–2001 in Finland. The two-stage stratified cluster sampling was representative of the Finnish population and included 8028 persons aged 30 years or over.<sup>29</sup> Five university hospital districts were used for the stratification and sampling, each serving approximately one million inhabitants and differing in several

features related to geography, economic structure, health services, and the sociodemographic characteristics of the population. First, the 15 largest cities were included with a probability of one. Next, within each of the five districts, all 65 other areas were sampled applying the probability proportional to population size (PPS) method. Finally, from each of these 80 areas, a random sample was drawn from the National Population Register.

The data collection phase started in August 2000 and was completed in March 2001, during which 92% of the sample attended at least one phase of the study. The participants were interviewed at home, where they were given a questionnaire, which inquired about their health, habits, and environment (eg, physical and depressive symptoms, burnout, physical activity, alcohol consumption, and psychosocial work characteristics). The questionnaire was to be returned at the clinical health examination, which included a structured interview on mental health, approximately 4 weeks later. During the interview, the respondents received an information leaflet and their written informed consent was obtained.

Of the total sample of 8028, 5871 persons were of working age (under 65 years). Of this base population, 88% were interviewed, 84% returned the questionnaire, and 80% participated in the mental health interview. On the basis of the home interview, 3387 working-aged participants were currently working and not taking maternity or parenting leave. Of these, 111 were excluded due to more than one missing value per dimension of the burnout inventory, reducing the study population to 3276 persons. Those with one missing value per dimension were included, and the missing value was replaced by the mean of the existing values on that dimension of that respondent. The presence of a depressive disorder could not be determined for six persons, leaving the final study population at 3270 persons.

### Burnout

Burnout was measured with the Maslach Burnout Inventory–General Survey (MBI-GS).<sup>2</sup> The MBI-GS consists of the following three subscales: exhaustion (five items, Cronbach's  $\alpha = 0.91$ ), cynicism (five items,  $\alpha = 0.79$ ), and (lack of) professional efficacy (six items,  $\alpha = 0.82$ ). The three-factorial validity of the complete measure has been confirmed for different occupations.<sup>30–33</sup> The items were scored on a 7-point frequency rating scale ranging from 0 (never) to 6 (daily). High scores on exhaustion and cynicism and low scores on professional efficacy are indicative of burnout. The items of professional efficacy were reversed (lack of professional efficacy).

To assess the level of burnout, a weighted sum score of the dimensional sum scores was calculated.<sup>34,35</sup> Exhaustion, cynicism, and lack of professional efficacy had different weights in the syndrome.<sup>5,36</sup> This syndrome indicator was constructed with the help of discriminant function analysis, in which various health-related indicators were used as dependent variables.<sup>37</sup> Coefficients were formed by weighting each dimension so that the scores corresponded to the original response scale ( $0.4 \times$  exhaustion +  $0.3 \times$  cynicism +  $0.3 \times$  lack of professional efficacy). Burnout was dichotomized as: no burnout (0–1.49 points: symptoms are experienced approximately a few times a year or never) or burnout (1.5–6 points: symptoms are experienced at least monthly).<sup>36</sup>

### Depression

The original Beck Depression Inventory was used to assess depressive symptoms.<sup>38,39</sup> It consists of 21 items that are scored from 0 to 3. An acceptable answer is expected for at least 14 items. The missing values (seven at the most) were replaced by the mean of the existing values of that particular respondent. A sum score for the depressive symptoms was then calculated. Depressive symptoms were dichotomized as no depressive symptoms

(0–9 points) or depressive symptoms (10–63 points).<sup>39</sup>

The mental health interview was performed at the end of the health examination using a standardized CIDI interview,<sup>40</sup> which has been shown to be a valid assessment measure of common mental nonpsychotic disorders.<sup>41</sup> A Finnish translation of the German, computerized version of the CIDI (M-CIDI) was used.<sup>40,42</sup> The program uses operationalized criteria for *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (DSM-IV) diagnoses<sup>43</sup> and allows the estimation of DSM-IV diagnoses for major mental disorders. In this study, we used the diagnoses for the preceding 12-month prevalence for major depressive disorder (MDD) and dysthymia.<sup>43</sup> Having a depressive disorder (yes/no) means having a diagnosis for MDD or dysthymia.

## Job Strain

Job strain was measured with the Job Content Questionnaire (JCQ).<sup>44</sup> The scale of job demands is comprised of five items ( $\alpha = 0.79$ ; eg, “My job requires working very fast”), and the scale of job control is comprised of nine ( $\alpha = 0.85$ ; eg, “My job allows me to make a lot of decisions on my own”; “My job requires a high level of skills”). Responses are given on a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree). To create an indicator of job strain, the job demand and job control scales were dichotomized at their median, and the following four subgroups were formulated: low strain (low demands and high control), active (high demands and high control), passive (low demands and low control), and high strain (high demands and low control).<sup>7</sup>

## Health

Research physicians gave the participants a comprehensive health examination, including a symptom interview and laboratory tests to determine whether they had any physical illnesses (yes/no). The diagnostic criteria of the physical illnesses were based on

current clinical practice. Lifetime mental disorders were assessed by a single-item question in the home interview by asking whether a doctor had ever confirmed a diagnosis of mental disorder (yes/no).

## Health Behaviors

Smoking, alcohol consumption, physical activity, and body mass index were assessed. Daily smoking (yes/no) was assessed in the home interview. Alcohol consumption (drinks/month) and the frequency of health-enhancing physical activity were assessed with the questionnaire. Health-enhancing physical activity included exercise causing at least slight shortness of breath and sweating at least 30 minutes at a time. It was classified as once a week or less, two to three times a week, or at least four times a week. Body mass index ( $\text{kg}/\text{m}^2$ ) was calculated on the basis of the clinical measurements during the health examination.

## Sociodemographic Factors

Information on the following sociodemographic factors was collected in the home interview: gender, age, marital status, occupation, type of business, and working hours (full-time or part-time). Marital status was divided into the following two groups: those who were married or cohabiting (married) and those who were divorced, widowed, or single (unmarried). Occupational grade was formed on the basis of occupation and type of business: upper grade nonmanual, lower grade nonmanual, manual workers, and self-employed.<sup>45</sup>

## Statistical Analysis

The relationship of gender and age to burnout, depressive symptoms, and depressive disorders was analyzed with univariate logistic regression analyses. The relationship of sociodemographic characteristics and health-related factors to burnout, depressive symptoms, and depressive disorders was analyzed separately with gender- and age-adjusted logistic regression analyses. Age- and gender-adjusted logistic regres-

sion models were calculated also to determine the association of burnout to depressive symptoms and to depressive disorders. Then we fitted separate age- and gender-adjusted logistic regression models to examine whether job strain was associated with burnout, depressive symptoms, or depressive disorders. To control for confounding factors, other socio-demographic, health behavior, and physical and previous mental health variables were also entered into the models as covariates. The final adjustment included also depressive symptoms and depressive disorders for the model with burnout as the outcome and burnout was also adjusted for in the models for depressive symptoms and depressive disorders as the outcomes. Interaction terms were applied to test whether the association between job strain and burnout, depressive symptoms, or depressive disorders were dependent on gender or working hours. Weighting adjustment and sampling parameters<sup>29,46</sup> were used in the analyses to correct possible bias caused by the complex sample survey data and the loss of participants. We used SAS and SUDAAN software for all of the statistical analyses.

## Results

The final study population comprised 1637 men and 1633 women. The weighted gender  $\times$  age distribution of the participants was similar to that of the total workforce.<sup>47</sup> The detailed characteristics of the study population are presented in Table 1. At the time of the home interview, 3% of the participants were on sick leave and 1% was on sabbatical.

Table 2 shows the relations of the demographic characteristics and health-related factors to burnout, depressive symptoms, and depressive disorders. Burnout was more common among the older workers, those who were unmarried, those who had a manual occupational status, those who consumed larger amounts of alcohol, those who were physically inactive or overweight, and those who had a physical illness or a history of mental dis-



**TABLE 1**  
Characteristics of the Study Population (*N* = 3270)

Characteristics	n (weighted %)	Mean (SE)
Gender		
Men	1637 (52)	
Women	1633 (48)	
Age (yr)		
30–34	517 (15)	
35–44	1116 (34)	
45–54	1236 (38)	
55–64	401 (13)	
Marital status		
Married or cohabiting	2558 (78)	
Unmarried	712 (22)	
Occupational grade		
Higher grade nonmanual	922 (28)	
Lower grade nonmanual	896 (27)	
Manual	958 (30)	
Self-employed	490 (15)	
Working hr		
Full-time	3034 (93)	
Part-time	236 (7)	
Daily smoking		
No	2456 (75)	
Yes	814 (25)	
Alcohol consumption (drinks/mo)	3185	26.4 (0.71)
Health-enhancing physical activity		
1 time a week or less	1431 (44)	
2–3 times a week	1146 (35)	
4 times a week or more	687 (21)	
Body mass index (kg/m <sup>2</sup> )	3269	26.4 (0.08)
Physical illness*		
No	1416 (43)	
Yes	1849 (57)	
Lifetime mental disorder†		
No	2964 (91)	
Yes	306 (9)	
12-mo prevalence of depressive disorder‡		
No	3066 (94)	
Yes	204 (6)	
Depressive symptoms (BDI)		
No (0–9 points)	2653 (81)	
Yes (10–63 points)	616 (19)	
Burnout (MBI-GS)		
No (0–1.49 points)	2370 (72)	
Yes (1.5–6 points)	900 (28)	
Job strain		
Low strain (low demand–high control)	838 (26)	
Active (high demand–high control)	700 (22)	
Passive (low demand–low control)	910 (28)	
High strain (high demand–low control)	732 (23)	

\*Diagnosis based on a comprehensive medical examination by a research physician.

†Self-reported single-item question on physician-diagnosed mental disorder.

‡Diagnosis based on the CIDI interview.

SE indicates standard error; BDI, Beck Depression Inventory; MBI-GS, Maslach Burnout Inventory–General Survey; CIDI, Composite International Diagnostic Interview.

order. Burnout was also related to depressive symptoms and to depressive disorders. The calculated odds ratio of burnout for depressive symptoms was 8.1 (95% confidence interval [CI] =

6.5–10.0) and for depressive disorders 5.0 (95% CI = 3.9–6.6). Depressive symptoms were more common among the women, the middle aged or older workers, and part-time employees (Ta-

ble 2). In addition, depressive symptoms had the same correlates as burnout with the addition of daily smoking. Depressive disorders were more common among the women, those unmarried, those who consumed more alcohol, and those who had a history of mental disorder.

Table 3 shows the relationship of job strain to burnout, depressive symptoms, and depressive disorders. Employees with high job strain, passive work, or active work had a higher risk of burnout than their counterparts with low job strain, the strongest association was found for high job strain (odds ratio [OR] = 7.4). These associations persisted after adjustment for the covariates, including depressive symptoms and depressive disorders. There was no significant attenuation in the strength of the association between job strain and burnout after these adjustments. High job strain, passive work, and active work were associated with depressive symptoms, and the strongest association was found for high job strain. However, these associations attenuated substantially after adjustment for burnout. For example, the odds ratio for high job strain declined from 3.9 to 1.9, the reduction in excess risk being 69% after adjustment. Corresponding results were obtained for depressive disorders. High job strain and active work were associated with depressive disorders before, but not after, adjustment for burnout. The reduction in risk of job strain for depressive disorders was 100% after adjustment for burnout.

An interaction effect between employment and job strain was found on burnout ( $P = 0.04$ ) and on depressive disorders ( $P = 0.01$ ); therefore, the analyses were performed also separately for full-time ( $n = 3034$ ) and part-time employees ( $n = 236$ ). High job strain had a stronger effect on burnout among full-time employees (adjusted OR = 7.10, 95% CI = 5.27–9.58) than among part-time employees (adjusted OR = 4.19, 95% CI = 1.31–13.4). Among

**TABLE 2**

Odds Ratios for Burnout, Depressive Symptoms, and Depressive Disorders by Gender and Age, and Age- and Sex-Adjusted Odds Ratios for Burnout, Depressive Symptoms, and Depressive Disorders by Other Demographic Characteristics and Health-Related Factors (*N* = 3270)

Characteristic	Burnout		Depressive Symptoms		Depressive Disorders	
	No. of Cases	OR (95% CI)	No. of Cases	OR (95% CI)	No. of Cases	OR (95% CI)
Gender						
Men	441	Reference	229	Reference	64	Reference
Women	459	1.07 (0.92–1.25)	387	<b>1.92 (1.61–2.30)</b>	140	<b>2.30 (1.67–3.18)</b>
Age (yr)						
30–34	130	Reference	68	Reference	39	Reference
35–44	265	0.91 (0.73–1.14)	184	1.31 (0.98–1.76)	67	0.80 (0.54–1.18)
45–54	347	1.15 (0.92–1.45)	268	<b>1.88 (1.41–2.51)</b>	70	0.77 (0.52–1.14)
55–64	158	<b>1.89 (1.44–2.49)</b>	96	<b>2.14 (1.54–2.98)</b>	28	0.96 (0.56–1.64)
In addition to gender and age						
Marital status						
Married or cohabiting	670	Reference	433	Reference	125	Reference
Unmarried	230	<b>1.33 (1.10–1.61)</b>	183	<b>1.63 (1.30–2.05)</b>	792	<b>2.28 (1.70–3.05)</b>
Occupational grade						
Upper nonmanual	230	Reference	153	Reference	52	Reference
Lower nonmanual	200	0.84 (0.68–1.04)	168	1.01 (0.78–1.30)	68	1.19 (0.82–1.71)
Manual	335	<b>1.69 (1.36–2.10)</b>	199	<b>1.47 (1.15–1.89)</b>	52	1.12 (0.75–1.65)
Self-employed	135	1.14 (0.89–1.46)	96	1.32 (0.98–1.79)	31	1.28 (0.79–2.08)
Working hr						
Full-time	823	Reference	548	Reference	183	Reference
Part-time	77	1.16 (0.88–1.52)	68	<b>1.54 (1.12–2.11)</b>	21	1.29 (0.78–2.13)
Daily smoking						
No	673	Reference	453	Reference	149	Reference
Yes	227	1.09 (0.91–1.31)	163	<b>1.24 (1.02–1.53)</b>	55	1.24 (0.90–1.73)
Alcohol consumption (per increase of 10 drinks/mo)	868	<b>1.03 (1.01–1.05)</b>	601	<b>1.05 (1.03–1.07)</b>	196	<b>1.05 (1.02–1.08)</b>
Health-enhancing physical activity						
4 times a week or more	155	Reference	104	Reference	39	Reference
2–3 times a week	286	1.18 (0.95–1.48)	178	1.11 (0.86–1.44)	63	1.00 (0.67–1.50)
1 time a week or less	457	<b>1.66 (1.35–2.04)</b>	332	<b>1.88 (1.47–2.40)</b>	101	1.34 (0.93–1.93)
Body mass index (kg/m <sup>2</sup> )	900	<b>1.02 (1.01–1.04)</b>	616	<b>1.03 (1.01–1.05)</b>	204	1.02 (0.99–1.05)
Physical illness*						
No	326	Reference	218	Reference	79	Reference
Yes	572	<b>1.43 (1.21–1.68)</b>	396	<b>1.38 (1.15–1.67)</b>	124	1.21 (0.89–1.65)
Lifetime mental disorder†						
No	762	Reference	479	Reference	126	Reference
Yes	138	<b>2.31 (1.82–2.94)</b>	137	<b>4.00 (3.18–5.03)</b>	78	<b>7.43 (5.51–10.0)</b>

\*Diagnosis based on a comprehensive medical examination by a research physician.

†Self-reported single-item question on physician-diagnosed mental disorder.

OR indicates odds ratio; CI, confidence interval.

part-time employees active and passive work were not related to burnout. In addition, active work seemed to have a stronger effect on depressive disorders among part-time employees (adjusted OR = 11.9, 95% CI = 0.87–162.6) than among full-time employees (adjusted OR = 0.92, 95% CI = 0.05–17.3). No statistically significant interactions between job strain and gender were evident in the models for burnout,

depressive symptoms, and depressive disorders (*P* > 0.07).

### Discussion

We found that high job strain was associated with higher occurrence of burnout, depressive symptoms, and depressive disorders than low job strain. The association between job strain and burnout was stronger than the associations between job strain and

depressive symptoms and depressive disorders. The effect of high strain on burnout was emphasized among full-time employees, possibly indicating ongoing accumulation of strain and fewer opportunities to recover from it in full-time employment. The association between job strain and burnout did not attenuate significantly after adjustment for sociodemographic factors, health behaviors, physical health, and all indicators of mental health. In con-

TABLE 3

Associations Between Job Strain and Burnout, Depressive Symptoms, and Depressive Disorders

Job Strain	n/No. of Cases	Model 1* OR (95% CI)	Model 2† OR (95% CI)	Model 3‡ OR (95% CI)
<b>Burnout</b>				
Low strain	820/95	1.00 (reference)	1.00 (reference)	1.00 (reference)
Active	688/161	<b>2.34 (1.75–3.12)</b>	<b>2.31 (1.72–3.11)</b>	<b>1.90 (1.39–2.60)</b>
Passive	880/240	<b>2.94 (2.24–3.86)</b>	<b>3.16 (2.38–4.19)</b>	<b>3.05 (2.25–4.13)</b>
High strain	702/342	<b>7.36 (5.62–9.65)</b>	<b>7.86 (5.99–10.3)</b>	<b>6.69 (5.06–8.82)</b>
<b>Depressive symptoms</b>				
Low strain	820/81	1.00 (reference)	1.00 (reference)	1.00 (reference)
Active	688/135	<b>2.29 (1.69–3.10)</b>	<b>2.36 (1.72–3.24)</b>	<b>1.81 (1.36–2.66)</b>
Passive	880/152	<b>1.84 (1.37–2.46)</b>	<b>1.84 (1.35–2.51)</b>	1.24 (0.89–1.75)
High strain	702/209	<b>3.75 (2.79–5.05)</b>	<b>3.89 (2.82–5.34)</b>	<b>1.89 (1.34–2.68)</b>
<b>Depressive disorders</b>				
Low strain	820/37	1.00 (reference)	1.00 (reference)	1.00 (reference)
Active	688/49	<b>1.57 (1.03–2.38)</b>	<b>1.58 (1.01–2.49)</b>	1.20 (0.76–1.91)
Passive	880/45	1.06 (0.69–1.63)	1.03 (0.63–1.66)	0.68 (0.41–1.13)
High strain	702/55	<b>1.69 (1.11–2.58)</b>	<b>1.66 (1.03–2.66)</b>	0.83 (0.52–1.34)

\*Adjusted for gender and age.

†Adjusted for gender, age, marital status, occupational grade, working hours, daily smoking, alcohol consumption, health-enhancing physical activity, body mass index, physical illnesses, and lifetime mental disorder.

‡Adjusted for gender, age, marital status, occupational grade, working hours, daily smoking, alcohol consumption, health-enhancing physical activity, body mass index, physical illnesses, lifetime mental disorder, depressive symptoms, and depressive disorder.

§Adjusted for gender, age, marital status, occupational grade, working hours, daily smoking, alcohol consumption, health-enhancing physical activity, body mass index, physical illnesses, lifetime mental disorder, and burnout. Significant results are printed in bold.

OR indicates odds ratios; 95% CI, 95% confidence intervals.

trast, the associations of job strain with depressive symptoms and depressive disorders reduced substantially or disappeared altogether when adjusted for burnout. To our knowledge, this is the first study to examine the association of job strain with burnout, depressive symptoms, and depressive disorders simultaneously. We used a representative population sample of a large health study that had a high rate of participation.

Although causal chains such as mediated effects cannot be inferred from observational epidemiologic data, such data can be used to test whether the observed associations are consistent with what one would expect to see if a causal path from job strain to burnout to depression would be true. Operationally, a mediated effect of burnout is demonstrated if two criteria are met.<sup>48</sup> First, one should document an association between burnout and depression.

Second, job strain should be associated with depression, and this association should be attenuated after adjustment for burnout. In our study, both criteria were met. The attenuation in the job strain–depression relationship was 69% or more after adjustment for burnout. A large share of the association between job strain and depression is probably explained by the increased burnout among the employees with high job strain. It is possible that burnout is a phase in the development of depression in situations in which the stressor preceding the onset of depression is work-related. Previous studies have also suggested that burnout may mediate between work characteristics and health when health was indicated by the duration of company-registered sickness absences<sup>49</sup> and psychosomatic health complaints.<sup>50</sup>

Empiric studies have shown evidence that the situation when job

demands are high in relation to job control is a risk factor to cardiovascular disease.<sup>22</sup> The job strain model postulates that this situation is also of primary importance in predicting mental strain.<sup>7</sup> Instead, active work, in which job demands and job control are matched, has been described in positive light and hypothesized to lead to development of new behavior patterns.<sup>7</sup> When compared with low job strain, active work and passive work were also related to burnout and depression in the present study, especially the associations between passive work and burnout persisted among full-time employees when adjusted for depression. In addition to psychologic job demands and job control, also other demands and resources at work (ie, emotional demands and social support) and the balance between effort and reward at work have been found to be related to burnout and health-related work

stress.<sup>8,50</sup> These results support the idea of different kinds of adverse working conditions being related to burnout.<sup>51</sup>

Several limitations are noteworthy. First, both job strain and burnout were self-assessed in this study. Therefore, the results are vulnerable to common method variance.<sup>52</sup> Subjective evaluation of work characteristics has been shown to be more strongly related to mental well-being than objective evaluation.<sup>27</sup> The Dutch version of the general burnout inventory used by us has been shown to be clinically valid.<sup>53</sup> Still, the assessment of burnout could benefit from multimethod assessment. Depression, on the other hand, was assessed both by self-report and by a standardized psychiatric interview. Even when depression was self-assessed, job strain was more strongly related to burnout than to depression.

Second, cross-sectional design is open to reversed causality. It is possible that employees who are currently depressed or burned out perceive the characteristics of their work more negatively compared with healthy employees. Therefore, no conclusions on causality can be determined on the basis of the results of this study. Previous prospective studies provide evidence on a causal chain from psychosocial work characteristics to mental well-being<sup>17–19,24,54,55</sup> being predominant rather than the other way around,<sup>15</sup> but burnout and depression have not been simultaneously included in these studies. Longitudinal studies on psychosocial work characteristics, burnout, and depression are warranted to examine the true causality between work and stress-related problems.

Third, recent stressful life events were not assessed in this study and could not therefore be controlled. It would have been interesting to determine the additional effect of current nonwork strain on burnout and depression. Earlier studies have implicated that the spillover from work to home is greater than the spillover from home to work.<sup>56,57</sup> The developmental process between the characteristics of work and private life

and burnout and depression is also an important subject for future prospective studies.

In conclusion, burnout is associated with high job strain independently of other factors and may in part mediate the association between high job strain and depression. These results are consistent with the conception of burnout being related to depression in the work context but suggesting that burnout is not redundant to depressive symptoms or to depressive disorders. In addition to high job strain, also active work with high demands and high control and passive work with low demands and low control were associated with burnout and depression. These results point to the need for developing the opportunities to control the work load and other characteristics of work in modern working life.

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