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Joint Effect of Chronic Medical Illness and Burnout on Depressive Symptoms Among Employed Adults

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Objective: Chronic medical illnesses (CMIs) are prevalent in nearly half the working population and are associated with a two-fold risk for developing depression. Burnout is a chronic affective state comprised of symptoms of emotional exhaustion, physical fatigue, and cognitive weariness. It is an outcome of depletion of energetic resources resulting from prolonged exposure to work and life stresses. Building upon the Conservation of Resources theory (Hobfoll, 1989), this prospective study was designed to test the hypothesis that CMI interacts with burnout to facilitate the development of depressive symptoms. ***Method:*** Participants were 4,861 employed men and women, aged 19 to 67 years, who came for routine health examinations and were followed for 18 months on average. Forty-seven percent reported having one or more diagnosed CMIs. ***Results:*** Burnout was found to predict an increase in depressive symptoms in apparently healthy individuals. Furthermore, the coexistence of burnout in employees with a CMI accelerates the process of developing depressive symptoms within a relatively short period. Burnout was also found to be associated with intensification of preexisting depressive symptoms in employees suffering from different chronic medical conditions (other than cancer), independent of medical comorbidities and other potent confounding variables. ***Conclusions:*** Among employees, coexistence of burnout and at least one CMI predicts an increase in depressive symptoms with time. Health care professionals should be made aware of such at-risk employees and follow and manage them closely.

Keywords: depression, burnout, chronic illness, employed adults

Accumulated evidence suggests that having a chronic medical illness (CMI) often leads to the development of depression or worsens its course (Benton, Staab, & Evans, 2007; Katon, 2011). The adjusted risk of having comorbid depressive disorders among persons with CMI may be double that of healthy controls (e.g., Egede, 2007; Katon, 2011). The presence of depression in persons with a CMI is associated with increased medical symptom burden, functional impairment, poor adherence to self-care regimens, and increased risk of morbidity and mortality (see review by Katon, 2011). The prevalence of CMIs in the working population may be as high as 75% (Munir, Leka, & Griffiths, 2005; Naessens et al., 2011).

Although the etiology of depression is multifactorial—accumulating evidence suggests that work-related psychosocial factors might be associated with an elevated risk of subsequent depression or a major depressive episode (for reviews, see Bonde, 2008; Siegrist, 2008; Stansfeld, & Candy, 2006). The present study, however, focuses on burnout (see definition below) as a potential predictor of depression risk because it represents the outcome of prolonged exposure to chronic work and life stresses (Melamed, Shirom, Toker, & Shapira, 2006b). The decision to focus on burnout is further supported by the findings of three prospective studies on job strain (work stress), burnout, and risk of depressive symptoms. In the first study (Ahola & Hakanen, 2007), both job strain and burnout were found to be prospectively associated with a risk for depressive symptoms but the association with job strain became nonsignificant after controlling for burnout; indicating the superiority of burnout over job strain as a predictor of future onset of depression. In the second study, Hakanen, Schaufeli, and Ahola (2008) reported a process whereby job demands predicted burnout over time, which in turn, predicted future depression. In a recent prospective study, a unidirectional association between burnout and occurrence of depressive symptoms was found. Burnout was shown to predict depressive symptoms, but not the converse (Hakanen & Schaufeli, 2012). However, despite existing knowledge that chronic medical illnesses constitute a risk factor for the

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development of depression, none of these studies tested the possibility that burnout might interact with coexisting medical illnesses to amplify that risk. Thus, the primary aim of the present study was to test the possible interactive effect of burnout and CMI in facilitating the development of depressive symptoms.

Burnout is a chronic affective state comprised of symptoms of emotional exhaustion, physical fatigue, and cognitive weariness (Melamed, Shirom, Toker, Berliner, & Shapira, 2006a; Shirom, 2003). It is an outcome of depletion of energetic resources resulting from prolonged exposure to work and life stresses and is considered a stable, chronic phenomenon (Melamed et al., 2006a). Burnout is conceptually and empirically distinct from depression despite empirical evidence showing that burnout measures have a positive, moderate correlation with depression (Schaufeli, & Enzmann, 1998). Burnout does not conceptually overlap with depression because it is contextualized to occur at work and is determined by the social environment there, whereas depression is a global state pervading all spheres of an individual's life (Suls & Bunde, 2005). Depression and burnout have been shown in quantitative (Glass & McKnight, 1966) and qualitative reviews (Melamed et al., 2006a; Schaufeli, & Enzmann, 1998) to be distinct entities. A recent confirmatory factor analysis suggested that both depression and burnout load on different factors (Toker & Biron, 2012).

The Putative Joint Effect of Burnout and CMI on the Development of Depression

Basic to this putative joint effect is the perception of common CMIs as stressful life events due to possible personal losses, such as loss of something valuable, loss of consistency in life, loss of physical strength, loss of control over bodily functions, loss of body wholeness, impaired functioning of body parts, harm to self-image, negative changes in family, and occupational roles (Wright, 1983) and life changes (e.g., loss of or change in employment, social relationships, and leisure activities), as well as an ongoing struggle with issues related to disease management (Dirik & Karanci, 2010; Thompson & Kyle, 2000). Psychological distress in patients with CMIs is well documented (e.g., Havik & Maeland, 1990; Pouwer, 2009) and can be understood on the basis of Hobfoll's (1989, 2002) Conservation of Resources (COR) theory. According to COR theory, individuals strive to obtain or maintain the things that they value, termed "resources." Stress occurs in the event of actual loss or threat of loss of resources. When individuals cannot cope with this stress effectively by allocating or investing in new resources, prolonged stress and eventually depressive symptoms may develop. Indeed, several studies have shown that patients with a CMI tend to perceive resource loss, which in turn predicts the distress symptoms of depression, anxiety, and anger (Dirik & Karanci, 2010; Lane & Hobfoll, 1992; Luyster, Hughes, Waechter, & Josephson, 2006).

As noted above, burnout was also shown to be directly associated with the development of depressive symptoms in healthy employed adults. Such links can also be explained based on COR theory (Hobfoll & Shirom, 1993, 2000), which stipulates that people feel burned-out when they perceive a continuous net loss of energetic coping resources resulting from cumulative exposure to chronic stressors in the workplace that cannot be replenished. Burned-out individuals may experience further exacerbation of their losses by entering an escalating spiral of losses (Hobfoll & Shirom, 2000). In turn, resource loss, resulting from a variety of sources, predicts affective states of anxiety, depression, and anger (Dirik & Karanci, 2010; Lane & Hobfoll, 1992; Luyster et al., 2006). Thus, taken together, the coexistence of burnout and CMI may accelerate the loss of energetic coping resources that cannot be replenished, leading to an affective state of depression.

This prospective study included employed adults having at least one of eight CMIs (see Method section), as well as employed healthy individuals (without any of the recorded CMIs). The inclusion of both groups permitted testing the following hypotheses, formulated based on the above reasoning:

> *Hypothesis 1:* Burnout and coexisting CMI at Time 1 (T1) have an interactive effect on the development of depressive symptoms over time, in such a way that employees with CMI and higher burnout levels, will exhibit a higher depressive symptom levels at follow-up (T2) compared with healthy counterparts.

In testing Hypothesis 1, all employees with at least one CMI were combined into one group, as was the practice in many other studies (e.g., Donders, Roskes, & van der Gulden, 2007). However, it is well recognized that chronic illnesses may vary in intensity, duration, controllability, and consequences. Furthermore, comorbidity among physical illnesses (Naessens et al., 2011) might pose an increased burden. Thus, it is important to determine whether burnout predicts an increase in depressive symptom levels for each of the chronic medical illnesses sampled here, while controlling for comorbidities. Thus, an additional hypothesis was tested:

> *Hypothesis 2:* Burnout at T1 predicts an increase in depressive symptoms levels at T2 separately for each chronic illness category sampled, even after controlling for coexisting medical illnesses.

These hypotheses were tested in a prospective study (with two waves of data collection), conducted with a large, multioccupational sample of working adults, while controlling for sociodemographic variables, prolonged life stressors, financial strain (a marker of sociodemographic status), and neuroticism (a dispositional variable), which is a predisposed susceptibility to heightened reactivity to major and minor life stressors (Costa & McCrae, 1992).

Method

Participants

All 10,177 healthy individuals who attended the Center for Periodic Health Examinations of the Tel-Aviv Sourasky Medical Center for routine health examinations at Time 1 were invited to participate in the Tel-Aviv Medical Center Inflammation Survey (TAMCIS) cohort study; 9,362 (92%) agreed. The 815 (8%) examinees that refused to participate in the study did not differ from participants on any of the sociodemographic or biomedical variables evaluated.

Of the participants examined at Time 1, 5,056 subjects (54%) returned for a follow-up examination at Time 2 (T2). The average

time interval between T1 and T2 was 18 months (SD = 7.01). As these examinations were sponsored by their employers as a subsidized fringe benefit, change of employment, fringe benefits, or health care provider resulted in the attrition of 46% of the participants from T1 to T2. However, testing for attrition bias from T1 to T2 by comparing the baseline characteristics of those who returned for a second visit with those who did not, revealed only minor differences. Those who did not return for a follow-up examination were more likely to be males, older (near retirement age), and less educated. These possible sources of attrition bias were controlled for in the data analyses, as explained below.

The 195 (4%) respondents who were not actively employed at Time 1 or Time 2 were excluded, as well as those who worked part-time (less than 3 hours per day), because the assessment of burnout is contextualized within the work domain. Thus, the final sample consisted of 4,861 (67% men) participants.

Procedure

The study protocol was approved by the ethics committees of the Sourasky Medical Center and the Faculty of Management at Tel-Aviv University. Participants were recruited individually by an interviewer while waiting for their clinical examination. They were promised, and subsequently received, detailed individual feedback on their results. Confidentiality was assured and each participant provided written informed consent.

Measures

Depressive symptoms were assessed by the validated measure of the Patient Health Questionnaire (PHQ8), an abbreviated version of the earlier PHQ9 measure of depression. This is a patient-oriented, self-administered instrument derived from the PRIME-MD (Kroenke et al., 2009). It lists eight potential symptoms of depression in accordance with the *DSM–IV* criteria, for example "Feeling down, depressed, or hopeless" or "Little interest or pleasure in doing things." Participants are asked to rate the frequency of experiencing each symptom during the past 2 weeks on a scale from 0 (*never*) to 3 (*always*), resulting in a continuous score from 0 to 24 (α = .79 and .78 for T1 and T2, respectively). The validity of the PHQ8 and PHQ9 (which are highly correlated, see Pressler et al., 2011) as a diagnostic and severity measure for depressive disorders has been confirmed in large clinical and nonclinical studies (Kroenke et al., 2009). This measure has strong psychometric properties (Kroenke, Spitzer, Williams, & Löwe, 2010; Pressler et al., 2011), high sensitivity and specificity for detecting depressive disorders (Kroenke et al., 2010), and when used as a continuous score, it has been shown to be interchangeable with the Beck Depression Inventory score (Johans et al., 2013; Kung et al., in press).

Chronic medical illness (CMI) was recorded based on an in-person medical interview conducted by a physician at the medical center. A medical interview was shown to have a better diagnostic value compared with responses from self-administered questionnaires (Bergmann, Jacobs, Hoffmann, & Boeing, 2004). A participant was coded as having a CMI if one or more of the following medical conditions were present: diabetes, cancer, cardiovascular disease, respiratory disease (asthma, bronchitis, etc.), neurological disease (Parkinson's, multiple sclerosis, etc.), musculoskeletal complaints (chronic neck pain, pain in the shoulder region, or lower back pain, etc.), rheumatic disease, or gastro-intestinal disease. These are the most prevalent chronic illnesses in Israel (Rennert & Peterburg, 2001) and they are often used in epidemiological studies (e.g., Egede, 2007; Gunn et al., 2012).

Burnout was assessed by the Shirom-Melamed Burnout Measure (SMBM), whose reliability and validity have been demonstrated in several studies (e.g., Melamed et al., 2006b; Shirom & Melamed, 2006). The SMBM consists of 14 items scored on a 7-point frequency scale, ranging from 1 = *almost never* to 7 = *almost always* (α = .92). Examples of the items are "I feel fed up" (physical fatigue); "I have difficulty thinking about complex things" (cognitive weariness); and "I feel I am unable to be sensitive to the needs of coworkers and customers" (emotional or interpersonal exhaustion). The SMBM was translated into several languages and is currently used in several countries, yielding findings that cross-validate the results obtained in Israel (see, e.g., Soares, Grossi, & Sundin, 2007). Burnout was used as a continuous measure.

Control Variables

In the statistical analysis, we controlled for the possible confounding effects of age, gender, education, marital status, number of children, neuroticism, financial strain, and the time between T1 and T2, assessed by calculating the delta (in months) between participants' first and second visits to the medical center.

We controlled for age, as it has been consistently associated with CMI and negatively associated with burnout (Schaufeli & Entzmann, 1998). We controlled for gender, as past studies documented gender differences in depression (Piccinelli & Wilkinson, 2000) and burnout levels (Purvanova & Muros, 2010). In a similar manner, lower education level (as a proxy of socioeconomic status) was found to be positively associated with an increased risk for depression (Chang-Quan, Zheng-Rong, Yong-Hong, Yi-Zhou, & Qing-Xiu, 2010). Marital status and number of children were controlled for, as they are related to stress levels and might lead to the development of burnout (e.g., Thoits, 2006). Each of the above variables was self-reported by the participants. Age, education, and number of children were used as continuous variables.

We also controlled for neuroticism based on COR theory, which highlights the importance of individual differences in perceived resource loss. Neuroticism is one of the basic personality dimensions of the Five Factor Model of Personality (Suls, 2001), defined as heightened reactivity to the occurrence of major and minor life stressors (Costa & McCrae, 1992). Several cross-sectional and longitudinal investigations found strong support for the associations between neuroticism and symptoms of burnout (e.g., Armon, Shirom, & Melamed, 2012), depression, morbidity, and mortality (see recent review of Lahey, 2009). Neuroticism was assessed by Saucier's Big Five Mini-Markers (Saucier, 1994), and included eight adjectives scored on a 9-point Likert scale ranging from 1 = *extremely inaccurate* to 9 = *extremely accurate* (α = .70).

Lastly, we controlled for financial strain as it has been repeatedly shown to predict depression (e.g., Price, Choi, & Vinokur, 2002). Financial strain was assessed by a 6-item measure reflecting financial difficulties such as "How often during the past month have you borrowed money to pay bills?" (Pearlin, 1999; Pearlin, Lieberman, Menaghan, & Mullan, 1981). Answers were scored on

a 5-point Likert scale ranging from 1 = *not at all* to 5 = *to a very large extent* (α = .83).

Statistical Analysis

Preliminary analyses. As a preliminary step, we conducted a Confirmatory Factor Analysis (CFA), using structural equation modeling (SEM) to confirm the divergent validity of job burnout and depression. We used the Amos software package. The results of the CFA suggest that the two-factor model better fit the data, yielding acceptable fit levels (see Hu & Bentler, 1999), χ^2 = 1105.98, *df* = 43, CFI = .91, TLI = .90, RMSEA = .07, SRMR = .04. The one-factor CFA yielded unacceptable fit levels, χ^2 = 2296.45, *df* = 44, CFI = .82, TLI = .78, RMSEA = .11, SRMR = .07. Results of χ^2 difference-test confirmed that the two-factor structure better fit the data than the one-factor structure. The two-factor structure represents a gain of 1 *df* for an excessive cost of χ^2 = 1190.472 (see Hu & Bentler, 1999). We also used the Akaike information criterion and BIC information theory-based indices to compare the models; both were smaller for the two-factor model (the preferred result). Additional information on the analysis and results can be obtained from the corresponding author upon request.

Main analyses. In order to examine whether the study variables predict changes in levels of depressive symptoms over time, ordinary least squares (OLS) regressions were used. In order to assess changes in depression levels, we used the continuous score of T2 depressive symptoms as a criterion variable while controlling for T1 depressive symptoms and the aforementioned controlled variables. Adding baseline levels of depression to the regression equation enables the measurement of change in the criterion (Twisk, 2003). In addition, *t* test or χ^2 were used, when appropriate, to test the significance of differences in study variables between participants with and without CMIs.

In the specific analyses designed to test the first hypothesis, OLS regression was used to predict changes in levels of depressive symptoms over time. The regression analysis included three steps: First we entered the control variables of T1 depressive symptoms, neuroticism, financial strain, age, gender, education, marital status, and number of children. Next, we entered having at least one CMI and T1 burnout. Last, we entered the interactive term of CMI × burnout. In additional analyses designed to test the second hypothesis, the association between T1 burnout and changes in depressive symptoms was tested separately for each of the CMI categories. Because of the small number of subjects in some CMI categories, we only controlled for age, gender, and comorbidity with other CMIs. We used this analytic strategy because it provided a strong, robust test of the hypothesis, as formulated. For measuring comorbidity, we employed a practice used in other studies (Egede, 2007; Gunn et al., 2012), where we used a simple count of the number of chronic physical illnesses out of the eight CMI categories described above.

Results

Descriptive Statistics

The frequency of categorical measures and means and standard deviations of continuous measures of the study variables for employees with and without CMIs are presented in Table 1. Levels of depressive symptoms, burnout, neuroticism, and financial strain were significantly higher ($p < .05$) among employees with at least one CMI compared with healthy employees.

The results of the OLS regression analysis that tested the predictors of change in the level of depressive symptoms over time, while controlling for the aforementioned possible confounders, are presented in Table 2. The results of Step 2 revealed a significant main effect of both burnout and CMI in predicting an increase in depressive symptoms from T1 to T2 (β = .15 and .07, respectively; $p < .01$, ΔR^2 = .03). The result of Step 3 confirmed the existence of an interactive effect of T1 CMI and T1 burnout on an increase in depressive symptoms (β = .07, $p < .01$, ΔR^2 = .01). In order to interpret this interaction, the association between burnout and an increase in depressive symptoms for employees with and without CMIs was plotted (see Figure 1). The graphs indicate

Table 1
Means and Standard Deviations (SD) of the Study Variables for the Employees With and Without CMI

	Employees with CMI N = 2,415		Employees without CMI N = 2,446		
	N	Percentage	*N*	Percentage	Significance of difference
Categorical variables					
Gender (Women)	874	(36.19%)	678	(27.7%)	$p < .001$
Marital status (Married)	1,658	(88.3%)	2,135	(87.3%)	n.s
Continuous variables	Mean	*SD*	Mean	*SD*	Significance of difference
Depressive symptoms (T2)	2.56	2.95	1.59	2.21	$p < .001$
Depressive symptoms (T1)	2.64	2.31	1.56	2.16	$p < .001$
Burnout (T1)	2.21	.83	2.01	.75	$p < .001$
Neuroticism (T1)	2.57	.73	2.58	.74	$p < .001$
Age (T1)	47.84	8.48	44.10	9.07	$p < .001$
Education (T1)	15.72	2.77	15.89	2.67	n.s
Number of children (T1)	2.61	1.12	2.42	1.21	$p < .001$
Financial strain (T1)	1.68	.75	1.54	.65	$p < .001$

Note. N = 4,861. CMI = Chronic Medical Illness.

Table 2
Regression Analysis of Depressive Symptoms at T2 on CMI and Burnout, Controlling for Depressive Symptoms at T1 and Other Possible Confounders

Measure	B	SEB	β
Step 1: Control variables			
Depressive symptoms, T1	.45**	.02	.47
Neuroticism, T1	.07*	.04	.03
Age, T1	.01	.01	.03
Gender	.40**	.07	.07
Education, T1	−.03	.01	−.03
Marital status	.14	.10	.02
Number of children	−.11*	.03	−.05
Financial strain, T1	.29**	.05	.08
Time lag	.01	.01	−.01
R^2		.38**	
Step 2: Main effects			
CMI, T1	.34**	.06	.07
Burnout, T1	.47**	.06	.15
ΔR^2		.03**	
Step 3: Interactive effect			
Burnout, T1 × CMI, T1	.25**	.07	.07
ΔR^2		.01**	

Note. $n = 4{,}861$; B and β represent the nonstandardized and standardized partial regression coefficients, respectively; SEB stands for the standard error of the former; CMI = Chronic Medical Illness.
* $p < .05$. ** $p < .01$.

that the increase in depressive symptoms associated with increased burnout levels was steeper among employees with CMIs, compared with those without a CMI.

As shown in Table 3, a similar trend was observed when testing the association between job burnout and increase in T2 levels of depressive symptoms for each CMI separately. Burnout was found to be a significant predictor of increase in T2 depressive symptoms for each CMI (except cancer), with βs ranging from .13 ($p < .05$) to .39 ($p < .01$), even after controlling for the aforementioned variables. Thus, providing support for the second hypothesis.

Discussion

To the best of our knowledge, this is the first study to explore the association between burnout and the development of depressive symptoms among employees with CMIs, in a large sample of multioccupational employed adults, controlling for neuroticism, demographic factors, and financial strain, a potential life stressor found to be associated with burnout (e.g., Soares, Grossi, & Sundin, 2007), depression (Price et al., 2002) and CMI (see Gallo & Mathews, 2003, for a review). The few existing longitudinal studies of the association between burnout and risk of depression did not investigate the possible interaction of burnout with CMIs, which are prevalent in the working population.

The incremental value of the current study is in showing that the coexistence of burnout and CMIs accelerates the development of depressive symptoms during follow-up, above the independent effect of each of these predictors. There was a significant interaction between burnout and CMI on the intensification of depressive over time. Plotting this interaction (see Figure 1) provided support for the main hypothesis of this study (Hypothesis 1). As hypothesized, increased burnout at T1 was associated with increased levels of depressive symptoms at follow-up (T2) in healthy employees. This change, however, was steeper in employees with CMIs. Thus, employees with CMI's who experience job-related burnout are more prone to develop depressive symptoms. As suggested above, this novel finding can be successfully explained on the basis of the comprehensive COR theory, introduced earlier. Loss and threat of resource loss are seen by the COR theory as precursors to distress and are also hypothesized to activate coping efforts aimed at averting further losses or replenish lost resources. The failure to cope successfully with losses is then manifested in various symptoms of general distress or specific types of psychological distress. Resource loss was independently shown to be associated with both chronic medical illnesses (Dirik & Karanci, 2010; Luyster et al., 2006) and burnout, measured by the SMBM (Vinokur, Pierce, Lewandoeski-Romps, Hobfoll, & Gala, 2011). Thus, it seems plausible that the coexistence of burnout and CMI's is likely to accelerate the loss of energetic coping resources that cannot be replenished, leading to worsening of existing depressive symptoms or development of such symptoms within a relatively short period.

Notwithstanding that the significant interaction term supports the first hypothesis, its contribution to the explained variance is low (1%). It should be added, however, that a small amount of explained variance in the predictor-outcome relationship is to be expected in longitudinal studies. For an extensive discussion of this issue, see Zapf, Dorman, and Frese (1996). Furthermore, in studies assessing the moderating effect of categorical variables (in our case, the existence or absence of CMI) using multiple regression, the effect size is rather small (Aguinis, Beaty, Boik, & Pierce, 2005). Furthermore, even very small effect sizes can still have substantial practical importance (Aguinis et al., 2005). Because the finding of a significant interaction effect is rare, it is more important to focus on whether the interaction is significant rather than focusing on its effect size (Aguinis et al., 2005; McClelland & Judd, 1993).

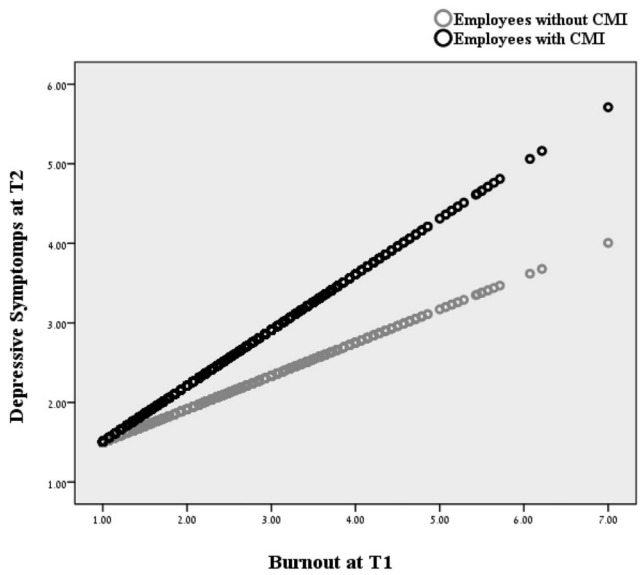

Figure 1. Level of depressive symptoms by burnout and the presence of CMI.

Table 3
Regressions Analysis of Depressive Symptoms at T2 on Each CMI Condition by Burnout, Controlling for Depressive Symptoms at T1, Age, Gender, and Comorbidity

	Participants		Participants with comorbid condition(s)				
CMI	N	%	N	%	B	SEB	β
Diabetes	137	2.81	67	49	1.35**	.21	.39
Cancer	111	2.28	56	50	.26	.40	.07
Cardiovascular disease	129	2.65	80	55	.74*	.38	.17
Respiratory disease	308	6.33	145	47	.47**	.18	.13
Neurological disease	176	3.62	97	55	.63*	.28	.17
Musculoskeletal complaints	1,668	34.31	784	47	.57**	.08	.16
Rheumatic disease	259	5.33	192	74	.68**	.24	.19
Gastro-intestinal disease	400	8.23	304	76	.46**	.16	.14

Note. CMI = Chronic Medical Illness.
* $p < .05$. ** $p < .01$.

This study also demonstrated, for the first time, that burnout was associated with increased levels of depressive symptoms at the 18-month follow-up within each of the eight chronic illness categories sampled, except for cancer: diabetes, cardiovascular disease, respiratory disease, neurological disease, musculoskeletal complaints, rheumatic disease, and gastro-intestinal disease. OLS regression analyses were conducted separately for persons in each disease category, while controlling for depressive symptoms at T1and for age, gender, and coexisting medical illnesses (β weights ranged from .13 [for respiratory disease] to .39 [for diabetes]). This finding suggests that burnout intensifies the experience of resource loss associated with having a CMI (except for cancer), although these diseases may vary in severity, duration, controllability, and consequences. It is possible that the nonsignificant result obtained for employees with cancer was due to insufficient statistical power to detect a change in depression symptoms over time, as there were relatively few employees in this group. Similar findings obtained in a recent Australian study demonstrated that the type of physical condition one has is not a significant determinant of depression risk, and the probability of depression is as much linked to health problems such as dermatitis and emphysema as it is to diabetes and heart disease (Gunn et al., 2012).

These findings lend additional support for the validity of the practice used here and in many earlier studies, of combining employees with chronic medical illnesses into one group, thus, permitting testing of the first hypothesis. In addition, the need to control for comorbid CMI's in the statistical analysis is consistent with the findings of previous studies (e.g., Naessens et al., 2011). In the present study, we found that 53% of the participants with a CMI reported having at least one comorbid condition. Comorbidity was found to be associated with increased risk of depression (Egede, 2007; Gunn et al., 2012) and might accelerate the development of depressive symptoms in employees with various CMIs. Thus, to enable comparisons between employees in the eight CMI categories, coexisting medical illnesses were controlled for.

Other findings of this prospective study indicate that over half (52.3%) of the employed persons sampled have at least one CMI. This fairly high figure is similar to that observed in other studies (Munir et al., 2005; Naessens et al., 2011) including that observed in the general population in Israel (Rennert & Peterburg, 2001). Congruent with common findings in the literature (e.g., Egede, 2007; Katon, 2011), employees with a CMI were found to have a higher mean score of depressive symptoms both at T1 and T2 compared with apparently healthy employees (without any of the CMIs sampled). Furthermore, multivariate analysis results indicated that having a CMI at baseline was associated with significantly increased levels of depressive symptoms during follow-up, even after controlling for levels of depressive symptoms at T1 and for other potent confounding variables. Consistent with findings of three previous studies (Ahola & Hakanen, 2007; Hakanen & Schaufeli, 2012; Hakanen et al., 2008), burnout was also found to have a main effect on increased depressive symptoms during follow-up.

A precondition for testing the theoretical model used here and in earlier studies testing the value of burnout in predicting the development of depressive symptoms or depressive disorder, is demonstrating that burnout and depression are two distinct entities (constructs). Earlier in the article, we mentioned the existence of evidence that comes from both qualitative and quantitative reviews that suggests that depression and burnout are two distinct conditions. Nevertheless, to test whether this assertion was confirmed by our data, a CFA analysis was conducted which supported the divergent validity of job burnout and depression.

The present study also contributes to ongoing efforts reported in the literature to identify individuals with a medical illness who are at increased risk for developing depression (see, e.g., de Jong et al., 2009). Our results suggest that employees with CMIs who also exhibit burnout symptoms might be at such risk. It is also possible that burnout will exacerbate the medical symptom burden of employee with CMIs, thereby increasing their functional disability and health care utilization. Burnout was found in past studies, to be associated with increased risk of physical morbidity as well as with risk factors for CMIs through different physiological mediators (for a review, see Melamed et al., 2006a). For instance, burnout has been found to be associated with risk of Type 2 diabetes (Melamed et al., 2006b), sleep disturbance (Armon, Shirom, Shapira, & Melamed, 2008), musculoskeletal pain (Armon, Melamed, Shirom, & Shapira, 2010), and impaired fertility (Sheiner, Sheiner, Carel, Potashnik, & Shoham-Vardi, 2002). Importantly, in some of these studies burnout was found to be associated with the out-

comes studied even after controlling for depressive symptoms. This finding provides support for the empirical distinction between burnout and depression, and reinforces the conclusions regarding the conceptual distinction between the two constructs.

Consistent with these findings, burnout levels at T1 were found to be higher in employees with a CMI compared with those without a CMI (see Table 1). However, the direction of this association cannot be ascertained. Further studies are needed to explore whether burnout leads to CMI's as well as whether CMIs lead to the development of burnout. Another venue for future research is examining the possibility that the existence of a state of burnout in employees with CMIs will contribute to poorer chronic illness control/disease management. Future research could directly examine whether the association between CMIs, burnout, and the intensification of depressive symptoms is indeed mediated by impaired health protective behaviors such as medication compliance. Future studies might also look into the specific resources lost as anticipated among employees with CMIs and burnout, and the possible mediating role of these lost resources based on the Conservation of Resources Evaluation measure (Hobfoll, 1989).

Certain limitations to this study must be noted. First, the chronic medical conditions were defined based on physician diagnosis during a medical interview. However, much evidence demonstrates the validity of interviewing as a clinical science, based on critical observation and analysis of the patient (Lichstein, 1990). Most clinicians rate the patient's medical history as having greater diagnostic value than either physical examination or results of a laboratory investigation (Rich, Crowson, & Harris, 1987). Other study variables, such as burnout and depressive symptoms, were also based on self-reports and are, therefore, potentially subject to common method bias. However, there are four reasons why the results of this study are unlikely to be subject to such a bias. First, following recommendations by Podsakoff, MacKenzie, Lee, and Podsakoff (2003), temporal and psychological separations were created in the current survey by (a) listing the items measuring the key concepts nonconsecutively, thereby increasing the likelihood that employees would respond to each set of key items without recalling their responses to prior sets; (b) inquiring about general depressive symptoms and work-related burnout, forcing respondents to think of different contexts; (c) interaction effects are unlikely to be subject to common-method bias, as respondents are unlikely to consciously theorize moderated relationships when they fill out a survey (Kotabe, Martin, & Domoto, 2003), especially when they do not know the survey's exact goal, as in the current case; and (d) the personality disposition of neuroticism (a global measure of negative affectivity), a possible confounding factor in studies employing self-report measures, was controlled for.

Another limitation of the current study is that the sample of subjects undergoing a periodic health examination may not be representative of the general population. Most of these individuals were of higher socioeconomic status (employees receiving a periodic health examination as a benefit from their employers) compared with the average working population in Israel. Therefore, given the established existence of a socioeconomic gradient of depression (e.g., Cole & Dendukuri, 2003), the confounding effect of this gradient was controlled for in the analyses. However, it is even more likely that the significant findings obtained here with regard to burnout, CMI, and depression would be replicated in samples that include a higher proportion of individuals of lower socioeconomic status.

Conclusions and Clinical Implications

Chronic medical illnesses are prevalent in over half of the workforce and are associated with a more than two-fold risk of developing depression. The existence of depression in persons with a CMI was found in earlier studies to be associated with increased medical symptom burden, functional impairment, the likelihood of health care utilization, and increased risk of morbidity and mortality.

Here, as in previous studies, burnout was found to be associated with an increase in depressive symptom levels over time in apparently healthy individuals. However, the incremental value of this prospective study is the demonstration that coexistence of burnout and CMI accelerates the process of developing depressive symptoms within a relatively short period.

Based on the findings of the present study, it seems advisable to suggest that employees with CMI who attend occupational health physician clinics should be evaluated for burnout, in order to minimize the risk of depression and other adverse outcomes outlined above. Subsequently, those manifesting high burnout levels could be referred to mental health professionals for treatment. Increasing evidence suggests that burnout treatment also reduces depressive symptoms (Hatinen et al., 2009; Stenlund et al., 2009). Furthermore, these employees might be referred to their primary health care provider who can initiate enhanced usual care or multifaceted interventions, drawing upon evidence for the efficacy of such programs in reducing depression as well as physiological risk factors (de Jong et al., 2009; Katon et al., 2010).

References

Aguinis, H., Beaty, J. C., Boik, R. J., & Pierce, C. A. (2005). Effect size and power in assessing moderating effects of categorical variables using multiple regression: A 30-year review. *Journal of Applied Psychology, 90,* 94–107.

Ahola, K., & Hakanen, J. (2007). Job strain, burnout, and depressive symptoms: A prospective study among dentists. *Journal of Affective Disorders, 104,* 103–110. doi:10.1016/j.jad.2007.03.004

Armon, G., Melamed, S., Shirom, A., & Shapira, I. (2010). Elevated burnout predicts the onset of musculoskeletal pain among apparently healthy employees. *Journal of Occupational Health Psychology, 15,* 399–408. doi:10.1037/a0020726

Armon, G., Shirom, A., & Melamed, S. (2012). The Big Five Personality Factors as predictors of changes across time in burnout and its facets. *Journal of Personality, 80,* 403–427. doi:10.1111/j.1467-6494.2011.00731.x

Armon, G., Shirom, A., Shapira, I., & Melamed, S. (2008). On the nature of burnout-insomnia relationships: A prospective study of employed adults. *Journal of Psychosomatic Research, 65,* 5–12. doi:10.1016/j.jpsychores.2008.01.012

Benton, T., Staab, J., & Evans, D. L. (2007). Medical co-morbidity in depressive disorders. *Annals of Clinical Psychiatry, 19,* 289–303. doi:10.1080/10401230701653542

Bergmann, M. M., Jacobs, E. J., Hoffmann, K., & Boeing, H. (2004). Agreement of self-reported medical history: Comparison of an in-person interview with a self-administered questionnaire. *European Journal of Epidemiology, 19,* 411–416. doi:10.1023/B:EJEP.0000027350.85974.47

Bonde, J. P. E. (2008). Psychosocial factors at work and risk of depression: A systematic review of the epidemiological evidence. *Occupational and Environmental Medicine, 65,* 438–445. doi:10.1136/oem.2007.038430

Chang-Quan, H., Zheng-Rong, W., Yong-Hong, L., Yi-Zhou, X., & Qing-Xiu, L. (2010). Education and risk for late life depression: A meta-analysis of published literature. *International Journal of Psychiatry Medicine, 40,* 109–124. doi:10.2190/PM.40.1.i

Cole, M. G., & Dendukuri, N. (2003). Risk factors for depression among elderly community subjects: A systematic review and meta-analysis. *American Journal of Psychiatry, 160,* 1147–1156.

Costa, P. T., & McCrae, R. R. (1992). *NEO PI-R. Professional manual*. Odessa, FL: Psychological Assessment Resources, Inc.

de Jong, P., Bel Hadry, F., Boffa, D., Zdrojjewski, C., Dorogi, Y., So, A., . . . Stiefel, F. (2009). Prevention of major depression in complex medically ill patients: Preliminary results from a randomized, controlled trial. *Psychosomatics, 50,* 227–233. doi:10.1176/appi.psy.50.3.227

Dirik, G., & Karanci, A. N. (2010). Psychological distress in rheumatoid arthritis patients: An evaluation within the conservation of resources theory. *Psychology & Health, 25,* 617–632. doi:10.1080/08870440902721818

Donders, N. C., Roskes, K., & van der Gulden, J. W. (2007). Fatigue, emotional exhaustion and perceived health complaints associated with work-related characteristics in employees with and without chronic diseases. *International Archives of Occupational and Environmental Health, 80,* 577–587. doi:10.1007/s00420-006-0168-6

Egede, L. E. (2007). Major depression in individuals with chronic medical disorders: Prevalence, correlates and association with health resources utilization, lost productivity and functional disability. *General Hospital Psychiatry, 29,* 409–416. doi:10.1016/j.genhosppsych.2007.06.002

Gallo, L. C., & Mathews, K. A. (2003). Understanding the association between socioeconomic status and physical health: Do negative emotions play a role? *Psychological Bulletin, 129,* 10–51. doi:10.1037/0033-2909.129.1.10

Glass, D. C., & McKnight, J. D. (1996). Perceived control, depressive symptomatology, and professional burnout: A review of the evidence. *Psychology & Health, 11,* 23–48. doi:10.1080/08870449608401975

Gunn, J. M., Ayton, D. R., Densley, K., Pallant, J. F., Chondors, P., Herman, H. E., & Dowrick, C. F. (2012). The association between chronic illness, multimorbidity and depressive symptoms in Australian primary care cohort. *Social Psychiatry and Psychiatric Epidemiology, 47,* 175–184. doi:10.1007/s00127-010-0330-z

Hakanen, J. J., & Schaufeli, W. B. (2012). Do burnout and work engagement predict depressive symptoms and life satisfaction? A three-wave seven-year prospective study. *Journal of Affective Disorders, 141,* 415–424.

Hakanen, J. J., Schaufeli, W. B., & Ahola, K. (2008). The Job Demands-Resources model: A three year cross-lagged study of burnout, depression, commitment, and work engagement. *Work & Stress, 22,* 224–241. doi:10.1080/02678370802379432

Hatinen, M., Kinnunen, U., Makikangas, A., Kalimo, R., Tolvanen, A., & Pekkonen, M. (2009). Burnout during a long term rehabilitation: Comparing low burnout, high burnout, high burnout benefited, and high burnout not benefited trajectories. *Anxiety, Stress & Coping, 22,* 341–360. doi:10.1080/10615800802567023

Havik, O. E., & Maeland, J. D. (1990). Patterns of emotional reactions after a myocardial infarction. *Journal of Psychosomatic Research, 34,* 271–285. doi:10.1016/0022-3999(90)90083-G

Hobfoll, S. E. (1989). Conservation of resources: A new attempt at conceptualizing stress. *American Psychologist, 44,* 513–524. doi:10.1037/0003-066X.44.3.513

Hobfoll, S. E. (2002). Social and psychological resources and adaptation. *Review of General Psychology, 6,* 307–324. doi:10.1037/1089-2680.6.4.307

Hobfoll, S. E., & Shirom, A. (1993). Stress and burnout in the workplace: Conservation of resources. In R. T. Golembienski (Ed.), *Handbook of organizational behavior* (pp. 41–46). New York, NY: Marcel Dekker.

Hobfoll, S. E., & Shirom, A. (2000). Conservation of resources theory: Applications to stress and management in the workplace. In R. T. Golembienwski (Ed.), *Handbook of organization behavior* (2nd revised ed., pp. 57–81). New York, NY: Dekker.

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6,* 1–55. doi:10.1080/10705519909540118

Johans, S. A., Kroenke, K., Krebs, E. E., Theobald, D. E., Wu, J., & Tu, W. (2013). Longitudinal comparison of three depression measures in adult cancer patients. *Journal of Pain Symptoms Management, 45,* 71–82.

Katon, W. J. (2011). Epidemiology and treatment of depression in patients with chronic medical illness. *Dialogues in Clinical Neuroscience, 13,* 7–23.

Katon, W. J., Lin, E. H. B., Von Korff, M., Ciechanowski, P., Ludman, E. J., Young, B., . . . McCulloch, D. (2010). Collaborative care for patients with depression and chronic illnesses. *The New England Journal of Medicine, 363,* 2611–2620. doi:10.1056/NEJMoa1003955

Kotabe, M., Martin, X., & Domoto, H. (2003). Gaining from vertical partnerships: Knowledge transfer, relationship duration, and supplier performance in the U.S. and Japanese automotive industries. *Strategic Management Journal, 24,* 293–316. doi:10.1002/smj.297

Kroenke, K., Spitzer, R. L., Williams, L. B. W., & Löwe, B. (2010). The Patient Health Questionnaire Somatic, Anxiety, and Depressive Symptoms Scales: A systematic review. *General Hospital Psychiatry, 32,* 345–359. doi:10.1016/j.genhosppsych.2010.03.006

Kroenke, K., Strine, T. W., Spitzer, R. L., Williams, J. B. W., Berry, J. T., & Mokdad, A. H. (2009). The PHQ-8 as a measure of current depression in the general population. *Journal of Affective Disorders, 114,* 163–173. doi:10.1016/j.jad.2008.06.026

Kung, S., Alarcon, R. D., Williams, M. D., Poppe, K. A., Jo Moore, M., & Frye, M. A. (in press). Comparing the Beck Depression Inventory-II (BDI-II) and the Patient Health Questionnaire (PHQ-9) depression measures in an integrated mood disorder practice. *Journal of Affective Disorders*.

Lahey, B. B. (2009). Public health significance of neuroticism. *The American Psychologist, 64,* 241–256.

Lane, C., & Hobfoll, S. E. (1992). How loss affects anger and alienates potential supporters. *Journal of Consulting and Clinical Psychology, 60,* 935–942. doi:10.1037/0022-006X.60.6.935

Lichstein, P. R. (1990). The medical interview. In H. K. Walker, W. D. Hall, & J. W. Hurst (Eds.), *Clinical methods: The history, physical, and laboratory examinations* (3rd ed., pp. 29–36). Boston: Butterworths.

Luyster, F. S., Hughes, J. W., Waechter, D., & Josephson, R. (2006). Resource loss predicts depression and anxiety among patients treated with an implantable cardioverter defibrillator. *Psychosomatic Medicine, 68,* 794–800. doi:10.1097/01.psy.0000227722.92307.35

McClelland, G. H., & Judd, C. M. (1993). Statistical difficulties of detecting interactions and moderators effects. *Psychological Bulletin, 114,* 376–390. doi:10.1037/0033-2909.114.2.376

Melamed, S., Shirom, A., Toker, S., Berliner, S., & Shapira, I. (2006a). Burnout and risk of cardiovascular disease: Evidence, possible causal paths, and promising research directions. *Psychological Bulletin, 132,* 327–353. doi:10.1037/0033-2909.132.3.327

Melamed, S., Shirom, A., Toker, S., & Shapira, I. (2006). Burnout and risk of Type 2 diabetes: A prospective study of apparently healthy employed persons. *Psychosomatic Medicine, 68,* 863–869. doi:10.1097/01.psy.0000242860.24009.f0

Munir, F., Leka, S., & Griffiths, A. (2005). Dealing with self-management of chronic illness at work: Predictors for self-disclosure. *Social Science & Medicine, 60,* 1397–1407. doi:10.1016/j.socscimed.2004.07.012

Naessens, J. M., Stroebel, R. J., Finnie, D. M., Shah, N. D., Wagie, A. E., Litchy, W. J., . . . Nesse, R. E. (2011). Effect of multiple chronic conditions among working-age adults. *American Journal of Managed Care, 17,* 118–122.

Pearlin, L. I. (1999). Stress and mental health: A conceptual overview. In T. L. Scheid & A. V. Horwitz (Eds.), *A handbook for the study of mental health: Social contexts, theories, and systems* (pp. 161–176). New York, NY: Cambridge University Press.

Pearlin, L. I., Lieberman, M. A., Menaghan, E. G., & Mullan, J. T. (1981). The stress process. *Journal of Health and Social Behavior, 22,* 337–356. doi:10.2307/2136676

Piccinelli, M., & Wilkinson, G. (2000). Gender differences in depression. Critical review. *The British Journal of Psychiatry, 177,* 486–492. doi:10.1192/bjp.177.6.486

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology, 88,* 879–903. doi:10.1037/0021-9010.88.5.879

Pouwer, F. (2009). Should we screen for emotional distress in Type 2 diabetes mellitus? *Nature Reviews Endocrinology, 5,* 665–671. doi:10.1038/nrendo.2009.214

Pressler, S. J., Subramanian, H., Perkins, S. M., Gradus-Pizlo, I., Kareken, D., Kim, J., . . . Sloan, R. (2011). Measuring depressive symptoms in heart failure: Validity and reliability of the Patient Health Questionnaire–8. *American Journal of Critical Care, 20,* 146–152. doi:10.4037/ajcc2010931

Price, R. H., Choi, J. N., & Vinokur, A. D. (2002). Links in the chain of adversity following job loss: How financial strain and loss of personal control lead to depression, impaired functioning, and poor health. *Journal of Occupational Health Psychology, 7,* 302–312. doi:10.1037/1076-8998.7.4.302

Purvanova, R. K., & Muros, J. P. (2010). Gender differences in burnout: A meta-analysis. *Journal of Vocational Behavior, 77,* 168–185. doi:10.1016/j.jvb.2010.04.006

Rennert, G., & Peterburg, Y. (2001). Prevalence of selected chronic diseases in Israel. *The Israel Medical Association Journal, 3,* 404–408.

Rich, E. C., Crowson, T. E., & Harris, I. B. (1987). The diagnostic value of the medical history. Perceptions of internal medicine physicians. *Archives of Internal Medicine, 147,* 1957–1960.

Saucier, G. (1994). Mini-markers: A brief version of Goldberg's unipolar Big-Five Markers. *Journal of Personality Assessment, 63,* 506–516. doi:10.1207/s15327752jpa6303_8

Schaufeli, W. B., & Enzmann, D. (1998). *The burnout companion to study and practice: A critical analysis*. Washington, DC: Taylor and Francis.

Sheiner, E. K., Sheiner, E., Carel, R., Potashnik, G., & Shoham-Vardi, I. (2002). Potential association between male infertility and occupational psychological stress. *Journal of Occupational and Environmental Medicine, 44,* 1093–1099. doi:10.1097/00043764-200212000-00001

Shirom, A. (2003). Job-related burnout. In J. C. Quick & L. E. Tetrick (Eds.), *Handbook of occupational health psychology* (pp. 245–264). Washington, DC: American Psychological Association. doi:10.1037/10474-012

Shirom, A., & Melamed, S. (2006). A comparison of the construct validity of two burnout measures in two groups of professionals. *International Journal of Stress Management, 13,* 176–200. doi:10.1037/1072-5245.13.2.176

Siegrist, J. (2008). Chronic psychosocial stress at work and risk of depression: Evidence prospective studies. *European Archives of Psychiatry and Clinical Neuroscience, 258,* 115–119. doi:10.1007/s00406-008-5024-0

Soares, J., Grossi, G., & Sundin, Ö. (2007). Burnout among women: Associations with demographic/socio-economic work, life-style and health factors. *Archives of Women's Mental Health, 10,* 61–71. doi:10.1007/s00737-007-0170-3

Stansfeld, S., & Candy, B. (2006). Psychosocial work environment and mental health. A meta-analytic review. *Scandinavian Journal of Work, Environment & Health, 32,* 443–462. doi:10.5271/sjweh.1050

Stenlund, T., Ahlgren, C., Lindhal, B., Burell, G., Steinholtz, K., Edlund, C., . . . Birgander, L. S. (2009). Cognitively oriented behavioral rehabilitation in combination with Qigong for patients on long term sick leave because of burnout: Rest—A randomized clinical trial. *International Journal of Behavioral Medicine, 16,* 294–303. doi:10.1007/s12529-008-9011-7

Suls, J. (2001). Affect, stress, and personality. In J. P. Forgas (Ed.), *Handbook of affect and social cognition* (pp. 392–409). Mahwah, NJ: Erlbaum.

Suls, J., & Bunde, J. (2005). Anger, anxiety, and depression as risk factors for cardiovascular disease: The problems and implications of overlapping affective dispositions. *Psychological Bulletin, 131,* 260–300. doi:10.1037/0033-2909.131.2.260

Thoits, P. A. (2006). Personal agency in the stress process. *Journal of Health and Social Behavior, 47,* 309–323. doi:10.1177/002214650604700401

Thompson, S. C., & Kyle, D. J. (2000). The role of perceived control in coping with the losses associated with chronic illness. In J. H. Harvey & E. D. Miller (Eds.), *Loss and trauma: General and close relationship perspectives* (pp. 131–145). Philadelphia, PA: Routledge.

Toker, S., & Biron, M. (2012). Job burnout and depression: Unraveling their temporal relationship and considering the role of physical activity. *Journal of Applied Psychology, 97,* 699–710. doi:10.1037/a0026914

Twisk, J. W. R. (2003). *Applied longitudinal data analysis of epidemiology*. Cambridge, UK: Cambridge University Press.

Vinokur, A. D., Pierce, P. F., Lewandowski-Romps, L., Hobfoll, S. E., & Gala, S. (2011). Effects of war exposure on air force personnel's mental health, job burnout and other organizational related outcomes. *Journal of Occupational Health Psychology, 16,* 3–17. doi:10.1037/a0021617

Wright, B. A. (1983). *Physical disability: A psychosocial approach* (2nd ed.). New York, NY: Harper and Row. doi:10.1037/10589-000

Zapf, D., Dorman, C., & Frese, M. (1996). Longitudinal studies in organizational stress research: A review of the literature with the reference to methodological issues. *Journal of Occupational Health Psychology, 1,* 145–169. doi:10.1037/1076-8998.1.2.145

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