

Original articles

# On the nature of burnout–insomnia relationships: A prospective study of employed adults

Galit Armon<sup>a</sup>, Arie Shirom<sup>a</sup>, Itzhak Shapira<sup>b</sup>, Samuel Melamed<sup>c,\*</sup>

<sup>a</sup>Faculty of Management, Tel-Aviv University, Tel-Aviv, Israel

<sup>b</sup>Tel-Aviv Sourasky Medical Center and Sackler Faculty of Medicine, Tel-Aviv University, Tel-Aviv, Israel

<sup>c</sup>Department of Epidemiology and Preventive Medicine, Sackler Faculty of Medicine, Tel-Aviv University, Tel-Aviv, Israel

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## Abstract

**Objective:** This prospective study was designed to test the hypothesis that burnout and insomnia predict each other's incidence and intensification across time. Burnout is conceptualized as representing individuals' unique affective response to their exposure to chronic stressors. **Method:** Apparently healthy respondents (1356) completed questionnaires during periodic health examinations undergone at two time points  $T_1$  and  $T_2$ , about 18 months apart. Burnout was assessed by the Shirom–Melamed Burnout Measure, while insomnia was assessed by the Brief Athens Insomnia Scale. Depressive symptomatology, neuroticism, body mass index, age, gender, follow-up duration, and  $T_1$  levels of the criterion were controlled. **Results:** Burnout and insomnia were found to be only moderately associated at  $T_1$ . However, logistic regression results indicated that burnout significantly predicted the development of new cases of insomnia

at 18-month follow-up [odds ratio (OR)=1.93; 95% confidence interval (95% CI)=1.45–2.58], even after adjusting for depression and other potent confounders. Likewise, insomnia significantly predicted the onset of new cases of burnout at 18-month follow-up (OR=1.64; 95% CI=1.30–2.08). Hierarchical regression results indicated that  $T_1$  burnout significantly predicted an increase in  $T_2$  insomnia ( $\beta=.05$ ,  $P<.05$ ), and that  $T_1$  insomnia significantly predicted an increase in  $T_2$  burnout ( $\beta=.07$ ,  $P<.05$ ). **Discussion:** The results indicate that burnout and insomnia recursively predict each other's development and intensification over time, thus suggesting that either might be a risk factor for the other across time. Possible mechanisms of link between burnout and insomnia, as well as the clinical implications of the findings, were suggested.

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## Introduction

In recent years, there has been growing interest in the long-term consequences of burnout. *Burnout* represents a negative affective state that comprises feelings of emotional exhaustion, physical fatigue, and cognitive weariness, and denotes depletion of energetic resources resulting from cumulative exposure to chronic work and life stresses [1].

Burnout has been shown to be relatively stable over time [1]. Accumulating evidence suggests that, in addition to its negative impact on quality of life and mental health [2], it is implicated in several disease states [1], including increased risk of cardiovascular disease (CVD) [1], diabetes [3], musculoskeletal disorders [4], and impaired fertility [5].

There is compelling evidence, based on both questionnaire data and objective polysomnographic recordings, pointing to an association between burnout and sleep disturbances, particularly chronic insomnia [6–9]. Insomnia is defined as difficulty in initiating sleep and/or maintaining sleep, prolonged awakening during the night, or waking up too early in the morning for more than a 1-month period [10,11]. Like burnout, insomnia has been described as a chronic

\* Corresponding author. Department of Epidemiology and Preventive Medicine, Sackler Faculty of Medicine, Tel-Aviv University, Ramat Aviv, PO Box 39010, Tel-Aviv 69978, Israel. Tel.: +972 508626743; fax: +972 773441319.

E-mail address: smelamed@post.tau.ac.il (S. Melamed).

disturbance [12,13] and has been shown to be associated with similar disease end points, mainly CVD [14–16].

The consistent finding of an association between burnout and insomnia, and the recurrent finding that both are related to the same disease end points suggest that they may influence each other across time. In order to understand the nature of the relationships between burnout and sleep disturbances, and for the clinical purpose of designing suitable interventions to alleviate them, it is desirable to determine whether burnout recursively predicts insomnia, whether insomnia recursively predicts burnout, or whether the relationship between them is bidirectional across time. However, past studies on burnout–insomnia relations were based on cross-sectional design, thus precluding elucidation of the contribution of each to the development of the other. Moreover, most previous studies were conducted on small (and sometimes clinical) samples. Such studies do not permit making causal inferences concerning the directionality of influence.

There is considerable evidence that both burnout and insomnia may be closely associated with chronic stress (for a review of the stress–insomnia linkage, see Jansson and Linton [17]; for a recent review of the stress–burnout linkage, see Melamed et al. [1]). Several longitudinal studies supported the effects of burnout on subsequent levels of worry and anxiety [18–20], and a heightened level of affective arousal could induce insomnia [13]. Indeed, the possibility that chronic burnout may bring about subsequent insomnia has been suggested by Schaufeli and Enzmann [2] and other researchers. Therefore, we have hypothesized that burnout would predict the development of insomnia across time or would intensify insomnia symptoms over time for those with insomnia symptoms at baseline. To our knowledge, this hypothesis has not been tested prospectively.

Based on the Conservation of Resources (COR) theory [21,22], we may also hypothesize that insomnia will predict the development of burnout across time. The COR theory postulates that stress at work occurs when individuals are threatened with resource loss, lose resources, or fail to regain resources following resource investment. Following the COR theory, we argue [23] that people feel burned out when they perceive a continuous net loss of energetic coping resources that cannot be replenished. Burned-out individuals may further exacerbate their losses by entering an escalating spiral of losses [24]. We expect the linkages between burnout and insomnia to represent a variant of an escalating spiral of losses, with insomniacs' sleep deprivation depleting their coping resources and intensifying the feeling of being burned out. Thus, we further hypothesized that insomnia would predict the onset of new cases of burnout with time or would intensify burnout symptoms over time in those with burnout symptoms at baseline. Again, this hypothesis has not been tested prospectively. The present study is the first attempt to examine the directionality of the linkage of burnout and insomnia in a follow-up study of apparently healthy employed adults.

## Method

### Sample

Study participants ( $N=1937$ ) were all apparently healthy employees attending the Center for Periodic Health Examinations of the Tel-Aviv Sourasky Medical Center for routine health examination at Time 1 ( $T_1$ ) and Time 2 ( $T_2$ ), 18 months apart on average. At  $T_1$ , they represented 92% of the center's examinees during this period who voluntarily agreed to participate in the study. We systematically checked for nonresponse bias at  $T_1$  and found that nonparticipants did not differ from participants on any of the sociodemographic or biomedical variables. We also tested for attrition bias from  $T_1$  to  $T_2$ . As compared with the study's participants, those examined at  $T_1$  who did not return for a follow-up examination after about 2 years (49%) were more likely to be male, to be older (near retirement age), to have self-reported a chronic disease at  $T_1$ , and to have reported spending less time in habitual exercise activity at  $T_1$ . These possible sources of attrition bias were controlled for in our data analyses, as explained below.

We excluded from the study 581 participants who self-reported diagnosed CVD and diabetes or who had suffered a stroke or a mental crisis, as well as participants who reported regularly taking antipsychotic medications or antidepressants. The decision to exclude such participants was based on previous findings suggesting that these disorders and medications could impact levels of burnout and fatigue [25], and may be associated with sleep difficulties (e.g., Schwartz et al. [15] and Foley et al. [26]). Thus, the final sample consisted of 1356 apparently healthy employees (65% male) (using a listwise option for the analyses results in slight sample size differences). The mean age at  $T_1$  was 47.87 years (S.D.=9.43). Respondents at  $T_1$  had completed a mean of 15 years of education; they worked for an average of 9.6 h/day.

### Procedure

The study protocol was approved by the ethics committees of the Sourasky Medical Center and the Faculty of Management at Tel-Aviv University. The participants were recruited individually by an interviewer while they were waiting for their clinical examination. They had been promised—and subsequently received—detailed feedback on the results. Confidentiality was assured, and each participant signed a written informed consent form that had been approved by the above ethics committees.

### Measures

Burnout was assessed by the Shirom–Melamed Burnout Measure (SMBM), whose reliability and validity have been demonstrated in a number of studies [1,3,27]. The SMBM consists of 14 items scored on a 7-point frequency scale

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