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Sleep physiology in recovery from burnout

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ABSTRACT

This study aimed to investigate the role of sleep physiology in recovery from burnout, in particular the relation between sleep and changes in fatigue and whether those changes would be related to return to work.

23 white-collar workers on long-term sick leave (>3 months) due to a burnout related diagnosis and 16 healthy controls were subjected to polysomnographic recordings at baseline and after 6–12 months' rehabilitation. Occupational status, subjective sleep quality, fatigue, anxiety and depression were assessed. Recovery from burnout was accompanied by improved sleep continuity. Significant interaction effects were seen for number of arousals, sleep fragmentation, sleep latency, sleep efficiency and time of rising. The burnout group improved significantly on all symptom variables although the post-treatment levels did not reach the levels of the controls. Recovery from fatigue was related to a reduction of the arousal from sleep and was the best predictor of return to work.

1. Introduction

In Sweden the amount of long-term (>30 days) sick leave has more than doubled over a period of 10 years (RFV, 2003; Weber and Jaekel-Reinhard, 2000). Most of this increase appears to be due to a long-term exposure to stress, with fatigue as the dominating symptom, but also including some depression and anxiety. "Fatigue" is a relatively loosely defined concept but most definitions assume that it is a state when energy loss exceeds energy availability (Grandjean, 1968; Piper, 1986), due to extended physical, emotional or mental activity, and/or to poor restoration, for example, inadequate sleep. Fatigue is also defined as an inadequate behavioral adaption to stress, developing from tiredness to exhaustion, with common attributes irrespective of etiology (illness, work, extended leisure or sport activities) (Olson, 2007; Olson et al., 2008). However this study focuses on fatigue due to work-related stress. In the absence of an existing diagnosis, the state was early labeled as "burnout" in accordance with the criteria of Maslach et al. (2001) or Melamed et al. (2006). In addition, the diagnostic category "Z73.0" of the ICD-10 (the 10th revision of the International Classification of Diseases) (WHO, 1992) was commonly used. Recently, the Swedish Board of Health and Welfare added "exhaustion syndrome" as a supplementary diagnosis to the Swedish version of the ICD-10 (Socialstyrelsen, 2005). "Work-related adjustment disorder" has also been proposed to cover the whole continuum of mild to severe burnout complaints (van der Klink et al., 2003).

Burnout levels seem to be stable over several years (Shirom, 2005; Taris et al., 2005) and most definitions emphasize the chronic character of burnout and its resistance to spontaneous recovery of the state of exhaustion (Maslach et al., 2001; Schaufeli and Buunk, 1996; Shirom, 1989). Despite a growing number of burnout rehabilitation studies, effective interventions to manage burnout are scarce (Schaufeli et al., 2001; McCray et al., 2008). In a randomized, treatment controlled study, comparing a no-treatment condition with two intervention conditions (cognitive behavioral treatment (CBT) and activation intervention focused on graded activity and workplace interventions) recovery from burnout symptoms and work ability were unrelated (Blonk et al., 2006). In this study both treatment groups exhibited symptom recovery similar to the no-treatment condition. The exhaustion

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levels decreased significantly within the first 4 months of sick leave but remained above the clinical cut-off score as assessed with the Maslach Burnout Inventory. Consistent with this, another study of clinically burned-out individuals who received CBT, showed recovery from exhaustion in 8.8 months of treatment (Mommersteeg et al., 2006). The exhaustion levels remained elevated however, compared to healthy controls and stabilized at that level 6 months after treatment. This study did not have any non-treatment condition. Both studies showed comparable results for depressed mood, anxiety and sleep problems (Blonk et al., 2006; Mommersteeg et al., 2006). Stenlund et al. (2009) found no difference between CBT and Qigong, although burnout indicators were significantly improved. Very similar results were seen in a comparison between individual or group stress management therapy or care as usual (de Vente et al., 2008). The results seem to indicate that pronounced recovery from burnout occurs across a relatively short period of time, but that the effect may be partly spontaneous, regardless of therapy.

Apart from fatigue, insomnia symptoms, like trouble falling asleep, non-refreshing sleep, early awakening and others have been reported in persons with high burnout scores in questionnaire studies (Grossi et al., 2003; Melamed et al., 1999; Vela-Bueno et al., 2008) and in sleep diary studies (Söderström et al., 2004; Ekstedt et al., 2006). The latter two studies are the only ones using polysomnography (electroencephalography, electro-oculography, and electromyography) to describe physiological sleep parameters. The results show a higher frequency of arousals from sleep, with poor restoration from sleep in individuals with high burnout scores but still at work (Söderström et al., 2004), In individuals on long-term sick leave with burnout related diagnoses (Ekstedt et al., 2006) more sleep fragmentation, decreased sleep efficiency (time in bed spent asleep), increased sleep latency, decreased slow wave sleep and decreased slow wave activity was seen. Sleep problems appeared to affect burned-out individuals independent of co-morbid major depression, suggesting that sleep problems are independent concomitant symptoms in burnout, despite their strong relationship with depression (Ekstedt et al., 2006; Shirom, 2005).

Changed sleep physiology in burnout may not only be yet another symptom of burnout; it might also be part of a mechanism, contributing to the cardinal symptom of fatigue. Indeed, acute sleep loss (Drummond and Brown, 2001) and sleep fragmentation (Jones and Harrison, 2001) are associated with increased sleepiness, impaired psychomotor and vigilance performance (Van Dongen et al., 2003; Horne, 1988), as well as impairment of executive function tasks like memory, creativity and planning skills (Horne, 1988; Bonnet and Arand, 2003). There are, however, only few studies that have tried to link impaired sleep to burnout in prospective studies. In one of these, Armon et al. (2008) found that insomnia at one point in time predicted burnout 18 months later (while controlling for initial burnout). Sonnenschein et al. (2007) demonstrated in a diary study that daily variation in fatigue was related to reports of impaired sleep, and that sleep played an important role in both symptom improvement and return to work (Sonnenschein et al., 2008). In a retrospective, qualitative study, Ekstedt and Fagerberg, 2005 found that severe difficulties sleeping were reported to precede the manifestation of burnout. None of these studies however used physiological measures of sleep, and there is a complete lack of information on how sleep physiology reflects, or is related to, recovery from burnout.

The main purpose of the present study was to investigate in what way sleep physiology, would change with recovery (regardless of cause) from burnout in a group on long-term (>90 days) sick leave with a burnout related diagnosis. A related question was whether there would be a correlation between a presumable reduction of burnout and changes in sleep physiology. Since the diagnosis of burnout is based mainly on the presence of high levels of fatigue, the latter was used to represent degree of recovery. Depression and anxiety are overlapping symptoms with burnout and it was, therefore, necessary to adjust for their role in any relation between fatigue and sleep physiology. A second criterion of recovery was return to work; a variable that does not seem to have been studied previously in relation to rehabilitation from burnout. A second purpose of the present study was to investigate the relation between recovery from burnout and return to work. The baseline study referred to above (Ekstedt et al., 2006) also used a technique of self-ratings every 3 h per day and found increased diurnal levels of being fatigued, sleepy and wound-up during weekdays as well as during weekends. A third purpose of the present study was to investigate whether improvement in burnout would be related to changes in these variables.

2. Methods

2.1. Participants

Twenty-three burnout patients (7 men, 16 women, mean age 44 ± 2) and 16 healthy controls (4 men, 12 women, mean age 43 ± 2) participated in the study.

The burnout group was recruited from the registers of an insurance company serving white-collar workers. 58 volunteers were examined and included if: (1) they fulfilled clinical symptoms of burnout: exhaustion impaired cognitive functioning due to long-term exposure to work-related stress; (2) they showed no Axis I or Axis II disorders, based on a Structured Clinical Interview (SCID) for DSM-IV, 4th edition (Association, 1994; First et al., 1997a, 1997b) and (3) they were on sick leave (fulltime) since at least 3 months. Lacking a formal ICD diagnosis, the Z73.0 (WHO, 1992) was used as an important additional inclusion criterion. When the included patients later were re-evaluated using the new diagnosis "exhaustion syndrome" according to the Swedish version of the ICD-10 (Socialstyrelsen, 2005) all were found to fulfill the criteria for that diagnosis.

The participants were assessed psychiatrically by an experienced clinician, using the Structured Clinical Interview (SCID) for DSM-IV, 4th edition (Association, 1994; First et al., 1997a, 1997b). Before the interview, participants completed questionnaires to assess previous life events (Deykin et al., 2001). Individuals with ongoing major depression and other Primary Axis I disorders were excluded from the study. No patients fulfilled criteria for an Axis II disorder. Other exclusion criteria were: heavy snoring and sleep apnea (as evidenced in self-reports and oxygen desaturation measurements). Eight patients were treated with Selective Serotonin Reuptake Inhibitors (SSRI) and five were taking SSRI and sleep-promoting drugs. Ten patients were non-medicated at baseline. At follow-up the prevalence of SSRI-intake was reduced to six and three still remained on both SSRI + sleep drugs. There were no use of beta-receptor blockers and other medication known to interfere with sleep. On the basis of the written report and/or the SCID-I assessment, the precipitating factors at the time of the illness were work-related problems in 70%, and family stress plus work-related stress in 52%. In 10 cases the psychiatric assessment was scheduled after the patients had entered the study, and from the 32 originally included patients 4 were excluded since the clinical examination revealed an Axis II diagnosis. One participant dropped out for family reasons. From these 27 patients 23 patients fulfilled the pre- and post-rehabilitation protocol.

Healthy controls were contacted through internal advertisement at the insurance company. Out of 45 volunteers 16 full-time white-collar workers (similar to the patients with respect to gender, age and occupation) were recruited. The Structured Clinical Interview (SCID) revealed no Axis I or Axis II disorders. None of the controls used hypnotics or antidepressants. There was no significant difference in other types of medical treatment between patients and controls. After recruitment, the participants were given verbal information about the procedures, and all signed a consent form. There was no monetary incentive involved for the patient group (which was on sick leave) but the control group received an economic compensation of ≈€220. The study was approved by the Ethics Committee of Karolinska Institutet.

2.2. Procedure

The burnout patients underwent a multi-modal rehabilitation program at a stress clinic in Stockholm. The program is based on accepted Cognitive Behavioral Therapeutic methods with the aim of reducing stress. The CBT interventions focused on stress coping strategies by enhancing the individuals' behavioral/emotional/cognitive skills, and consists of psychoeducation (for example, stress reactions, affect, medication, the balance between daytime activity and rest), awareness of individual responses, social and time-management skills and cognitive restructuring (Jones and Johnstone, 2000; Beck, 1979). The CBT interventions also included relaxation training according to Bernstein and Borkovec (1973) aimed to reduce arousal. Treatment of sleep disorder was not an explicit focus of the CBT. In addition an individual–organization interaction was undertaken through a contact person, which supported the communication with the supervisor at the workplace.