



Review

A biological perspective on differences and similarities between burnout and depression



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ABSTRACT

To compare and contrast burnout and depression is not only a conceptual issue, but may deliver important directions for treatment approaches and stabilize the awareness of disease which is essential for affected individuals. Because of the symptomatic overlap, it is a subject of multidimensional research and discussion to find specific signatures to differentiate between the two phenomena or to present evidence that they are different aspects of the same disorder. Both pathologies are regarded as stress-related disorders. Therefore, in this review burnout and depression are discussed on the basis of biological parameters, mainly heart rate variability (HRV) and brain-derived neurotrophic factor (BDNF), which are crucial to the stress response system. It emerges that instead of finding one specific discriminating marker, future research should rather concentrate on elaborating indices for burnout and depression which integrate combinations of parameters found in genetics, neurobiology, physiology and environment.

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1. Introduction

Finding a designation that describes and explains somatic and emotional suffering is essential for an individual's self-esteem stability (Hillert and Marwitz, 2008). This desire may be a driving force in the search for specific markers that might differentiate the similar but still not same phenomena depression and burnout.

The burnout syndrome was originated by the American psychoanalyst Herbert Freudenberger. In 1974, he described the phenomenon that occurred to the “dedicated and committed” usually one year after they had begun working in care-giving occupations (Freudenberger, 1974). Soon, the concept of burnout has been applied to a variety of other professions. To date, neither a concrete scientific description, nor a code in the classification systems (DSM-IV, ICD-10) exist. However, there are three symptoms which are commonly accepted as the core dimensions of burnout, namely exhaustion, depersonalization (cognitive distance toward job by a cynical attitude) and reduced professional efficacy (Maslach et al., 2001) which are a prolonged reaction to chronic interpersonal and emotional stress at work (Maslach and Goldberg, 1998). There is an extended concept that describes the burnout syndrome as a process of increasing exhaustion paralleled by decreasing mental and physical efficiency, caused by chronic stressors in the context of performance in general, which are progressively perceived as non-manageable (Ballweg et al., 2013). Thus, the etiology of burnout is generally thought to be long-term stress. Today, stress is seen in connection with highly demanding and exhausting psychological or emotional situations at work or in social relationships. Irrespective of its character (physical, physiological, emotional, social etc.), the response to stressors follows a common translational physiological pathway, ending up in a dysregulation of homeostatic systems such as the hypothalamus-pituitary-adrenal gland (HPA) –axis (McEwen, 1998). There is broad range of chronic stress-related disorders including migraine, essential hypertension, irritable bowel syndrome, chronic fatigue, fibromyalgia or neurasthenia (Eggers, 2007; Grassini and Nordin, 2015). Chronic stress is also considered as one of the most potent non-genomic factors in the development of mood disorders (Gold and Chrousos, 2002). Also major depressive disorder (MDD) is generally considered a stress-related disorder (Bouma et al., 2011; Kessler, 1997; Tennant, 2002). In contrast to the burnout syndrome, MDD is a classified mental disorder (American Psychiatric Association, 2000), and with an estimated life-time risk of at least 10% one of the most common psychiatric illnesses (Kessler et al., 2003; Weissman et al., 1996). Its characteristics are depressed mood, anhedonia, feelings of hopelessness and guilt, various physical symptoms and an inability to work (American Psychiatric Association, 2000; Meier, 1984). To date depressive disorders – resulting from job stress – become a major cause of absences from the working place (National Institute for Occupational Safety and Health (NIOSH), 1999).

The question is why the burnout syndrome is not accepted as a disorder in the international classification systems, while other stress-related disorders are. It is subject of a long and inexhaustible discussion if the burnout syndrome and MDD represent different pathologies with overlapping symptoms or if they describe aspects of the same disorder (Bianchi et al., 2015; Schonfeld and

Bianchi, 2016). Depression has been considered as a symptom of burnout (Freudenberger, 1974), as the final state of burnout (Weiskopf, 1980) and as a synonym for burnout (Ficklin, 1983). Meier (1984) reported that measures of burnout correlated highly with depression, weakening the support for burnout's discriminant validity. Bianchi et al. (2013) found no significant difference in the Beck Depression Inventory-II (BDI-II) (Beck et al., 1988) between depressed and burnout patients. As the BDI scores were similar in the burnout and the MDD group except for one criterion, they concluded that burnout and depression might not be separate pathological entities. Similarly, Gan et al. (2013) showed by means of a double cluster analysis – a method clustering data into meaningful groups and exploring similarities or differences between individual data points in these clusters – that burnout and depression measured by the Maslach Burnout Inventory (MBI) and BDI show a conceptual overlap of 38.7%. Results of the Finnish Health Study 2000 including 3276 employees also showed a marked overlap between burnout and MDD (Ahola et al., 2005). They reported increasing probability of having MDD with higher scores on the MBI burnout scale. Thus, one conclusion was that burnout could be viewed as a phase in the development of MDD (Ahola et al., 2005). However, they also concluded that job-related burnout and depressive disorders are overlapping but not identical concepts and should be therefore treated differently. There are other contributions supporting the view that MDD and burnout share many common symptoms, but that the characteristic features of these two concepts are distinct. In MDD depressed mood and loss of interest or pleasure are predominant. In burnout demoralization, fatigue and increased irritability are typical (Kakiashvili et al., 2013). Indeed, there is an approach stating MDD as an exclusion criterion for burnout (von Kanel, 2008).

What may be considered as a conceptual discussion is basically an important question in terms of appropriate treatment, therapy and prognosis (Ahola et al., 2005; Ballweg et al., 2013; Kakiashvili et al., 2013). To date, burnout and other chronic stress-related disorders are often treated as depression or not treated at all (Kakiashvili et al., 2013) and no evaluated specific therapy concepts exist.

There are several approaches trying to characterize and contrast burnout and MDD not only in terms of symptoms and etiology, but also by means of biological parameters (Danhof-Pont et al., 2011; Mommersteeg et al., 2006; Onen Sertoz et al., 2008). In this review, the aim is to elaborate similarities and differences between burnout and MDD focusing on two biological correlates of stress: heart rate variability (HRV) and brain-derived neurotrophic factor (BDNF). As BDNF has a crucial role in neuroneogenesis, hippocampal volume is also considered. The typical “stress hormone” cortisol was not incorporated into the present discussion, as there is large impact of heredity on basal free cortisol levels (Bartels et al., 2003) what might explain the large body of inconsistent findings on HPA-axis functioning, i.e. cortisol, in burnout (Mommersteeg et al., 2006). Both HRV and BDNF are at least as crucial in stress response as cortisol. HRV mirrors the autonomic nervous system as it offers immediate and precise information about parasympathetic activity and withdrawal, respectively, and thus about stress reactivity. BDNF is involved in neuronal survival and neurogenesis in the hippocampus, which in turn represents a superordinate authority in

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