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Burnout and cortisol: Evidence for a lower cortisol awakening response in both clinical and non-clinical burnout

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ABSTRACT

Objective: Although the relationship between burnout and cortisol levels has been examined in previous studies, the results are mixed. By adopting a design in which we attempted to overcome important limitations of earlier research, the purpose of the present study was to improve the understanding of the biological underpinnings of burnout and to further the knowledge about the relationship between burnout and cortisol.
Methods: A clinical burnout patient group ($n = 32$), a non-clinical burnout group ($n = 29$), and a healthy control group ($n = 30$) were compared on burnout symptoms, physical and psychological complaints, and on cortisol levels. In order to examine a broad range of cortisol indices, including different measures of the cortisol awakening response (CAR) and several day-curve measures, salivary cortisol was collected six times a day during two consecutive non-workdays.
Results: As expected, the clinical burnout group reported more burnout symptoms, and physical and psychological complaints than the non-clinical burnout group, which in turn reported more burnout symptoms and physical and psychological complaints than the healthy control group. With regard to cortisol levels, we found that until 30 min after awakening, the CAR of both the clinical and the non-clinical burnout group was lower compared with the healthy control group. Furthermore, there was some evidence that the decline of cortisol during the day was smaller in the non-clinical burnout group than in the healthy control group.
Conclusion: The results of the present study provide support for lowered cortisol in both clinical and non-clinical burnout.

Introduction

Burnout is a work-related chronic stress syndrome characterized by exhaustion, cynicism (a distant attitude towards the job), and feelings of reduced professional efficacy [1]. Since burnout is generally the result of a prolonged period of stress, it is often hypothesized that the hypothalamic–pituitary–adrenal axis (HPA axis), a part of the neuroendocrine system involved in the regulation of reactions to stress, may be disturbed in individuals with burnout (e.g., [2–5]). As the major output of the HPA axis is the stress hormone cortisol, cortisol levels are believed to differ in individuals with burnout relative to the levels in healthy individuals. Specifically, whereas acute stress leads to increased cortisol levels, a general notion is that chronic stress, which is usually the case in burnout, can lead to a 'breakdown of the HPA axis' resulting in decreased cortisol levels (e.g., [6–8]).

The results of previous studies on the relationship between burnout and cortisol, however, do not always fit with this line of reasoning. Although, for example, Sonnenschein et al. [9] and Marchand et al. [10] indeed found burnout to be related to reduced levels of cortisol, Melamed et al. [4] and De Vente et al. [5], on the other hand, found evidence for elevated levels of cortisol. In addition, some studies (e.g., [11,12]) failed to find any cortisol deviations in burnout. For a more comprehensive review of the literature, see Danhof-Pont et al. [13].

Several factors may underlie these mixed findings, such as heterogeneity in the assessment of cortisol, potential confounding variables which were not controlled for and the relatively small sample size in some of the previous studies. Yet perhaps the most important and fundamental factor might be the large variety of operationalizations of burnout that are used in earlier research. That is, in some studies, the burnout group comprised clinically diagnosed burnout patients [14,15], whereas in other studies (e.g., [10,16]), the burnout group consisted of healthy undiagnosed individuals who were solely selected

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on the basis of a high score on a burnout questionnaire (i.e., reporting symptoms of a burnout). In addition to the latter, the type of burnout questionnaire which was used for this purpose also varied (e.g., compare [4,17]). Also, the criteria used for diagnosing a clinical burnout are not always clear (e.g., [18,19]) and differ between studies (compare e.g., [3, 20]). Furthermore, in a large number of studies in which a clinical burnout sample was examined, no information was provided about the time between the diagnosis of burnout and participation in the study, or the time between diagnosis and participation was relatively long (e.g., [5,21]). This may be problematic because treatment or maturation effects might have interfered. A final and key aspect with regard to the diagnosis of clinical burnout is the comorbidity of other mental disorders. Specifically, although there is substantial evidence indicating that, for example, mood and anxiety disorders have an effect on cortisol (i.e., elevated cortisol levels; e.g., [22,23]), in former research, burnout patients with comorbid mental disorders were not always excluded, and/or the effects of comorbidity were not always controlled for (e.g., [18,19]). In these studies, the observed cortisol levels in burnout patients may possibly have been influenced by mental disorders other than burnout. Finally, a factor potentially affecting the validity of the observed cortisol levels in previous studies is the day on which the cortisol samples were collected. Research has shown that cortisol levels are generally higher on workdays than on days off work (e.g., [24–26]). Yet in almost all previous studies on the relationship between burnout and cortisol, the cortisol sampling procedure took place during workdays. This may have affected the results of those studies in which the burnout group consisted of clinical burnout patients who were (largely) not working (i.e., on sick leave) and in which the control group comprised healthy participants who were working during the sampling procedure.

The purpose of the present study was to further examine cortisol levels in burnout with a design that enabled us to overcome these limitations of former research. To this end, we carefully selected a group of recently clinically diagnosed burnout patients without comorbid mental disorders, to rule out the effect of other psychopathologies. In addition, we included a non-clinical burnout group consisting of employees who reported to have burnout symptoms, but who were not clinically diagnosed as burnout patients and were not seeking help for these symptoms. Cortisol levels of both groups were compared with a matched control group consisting of healthy employees. In order to examine a full range of cortisol indices, including different measures of the cortisol awakening response (CAR) and multiple day-curve measures, salivary cortisol was sampled six times a day during two-consecutive non-workdays. As noted above, we chose to collect cortisol on non-workdays to make sure that the sampling conditions were equal between the three different employee groups.

In sum, the aim of the present study was to determine how both clinical burnout and non-clinical burnout are related to cortisol levels.

Methods

Participants

The sample was part of a larger longitudinal research project, in which both cortisol levels and cognitive performance in burnout were studied (see also [27]). In total, 91 employees participated in the present study. Thirty-two had received a clinical burnout diagnosis (the clinical burnout group), 29 reported burnout symptoms but were neither diagnosed as burnout patients nor seeking help for these symptoms (the non-clinical burnout group) and 30 were healthy individuals (the control group). Initially, the clinical burnout group and the non-clinical burnout group consisted of 33 and 30 participants, respectively. However, one participant was excluded from each of these groups due to non-compliance with the cortisol sampling instructions. One participant did not fill out the diary (see Procedure), and one did not sample on two consecutive non-workdays. The three groups were matched on several demographical characteristics (see Table 1 for more detailed information) and consisted of employees with various occupational backgrounds. All participants were financially compensated for their participation.

The participants in the clinical burnout group were patients from HSK Group, a large mental healthcare organization in the Netherlands. Patients were selected on the basis of their burnout diagnosis as established by a team of two or three professional clinical psychologists. A burnout diagnosis was based on an intake procedure in which a structured clinical interview was used containing the Dutch translation [28] of the MINI International Neuropsychiatric Interview 5.0.0 (M.I.N.I.; [29]) and the Assessment of DSM-IV Personality Disorders (ADP-IV; [30]). Since burnout is not officially included in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR; [31]), in the Netherlands, a burnout diagnosis is usually based on the DSM-IV-TR criteria for diagnosing an undifferentiated somatoform disorder with the addition that the cause of the symptoms must be work related. This method was also used in the present study. As an additional tool to validate the burnout diagnosis, patients filled out the Utrecht Burnout Scale (UBOS; [32]; see Measures section for more information). Patients were excluded if they fulfilled the DSM-VI criteria for any other axis I or II disorder, as assessed with the M.I.N.I. and the ADP-IV, respectively. Approximately 40% of the eligible burnout patients agreed to participate in the study after being contacted by telephone. Of the 32 participating patients, 12 were on sick leave due to their burnout, 15 continued working but worked fewer hours than prior to their burnout diagnosis and 5 remained working the same number of hours as before their diagnosis.

The participants in the non-clinical burnout group and the control group were recruited via local advertisements and social networking. Potential participants filled out a screening questionnaire in which several demographical characteristics (used to match the different groups; see Table 1), the exhaustion subscale of the UBOS and (history of) psychiatric disorders were assessed. Individuals with an average score on the exhaustion subscale of the UBOS equal to or higher than the cutoff point of 2.20 [32] were allocated to the non-clinical burnout group and those with scores below the cutoff point to the control group. Individuals with a current psychiatric disorder or with a past history of burnout were excluded.

Materials

Utrechtse Burnout Scale

Burnout symptoms were assessed with the UBOS [32], which is the Dutch adaptation of the Maslach Burnout Inventory (MBI; [33]). The version for general professions (UBOS-A; [32]) was used, which contains 15 questions that can be answered on a 7-point Likert scale (0 = “never”, 6 = “every day”). The questionnaire consists of an exhaustion, a cynicism and a professional efficacy subscale. Cronbach's alphas of the subscales were, respectively, .95, .87 and .78.

Symptom Checklist-90-Revised

General physical and psychological complaints were assessed with the Dutch adaptation [34] of the Symptom Checklist-90-Revised (SCL-90-R; [35]). The questionnaire contains 90 items divided into nine subscales: eight measuring primary symptom dimensions, and one measuring more general symptoms. Each item can be answered on a 5-point Likert scale (1 = “not at all”, 5 = “extremely”). The sum of all items results in a psychoneuroticism score, which is the equivalent of the Global Severity Index in the English version. Cronbach's alpha of this questionnaire was .98.

Cortisol

Salivary cortisol was collected on two consecutive non-workdays. On both of these days, participants individually collected six saliva samples: at awakening, 30 min after awakening, 60 min after awakening, at 12:00 h, 17:00 h and 22:00 h. On average, the patients in the burnout