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Sick and tired: psychological and physiological aspects of work-related stress

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Summary

Work-related stress is a state of distress due to exposure to work-related stressors. It is associated with a great personal and societal burden in terms of both human suffering and economical losses. The aim of this thesis was twofold: a) to enhance the insight in fundamental physiological and psychological characteristics of work-related stress, and b) to assess whether cognitive behavioural treatment (CBT) is an effective treatment for work-related stress.

In this thesis, we adopted the clinical definition of work-related stress formulated by the Netherlands Society of Occupational Medicine (2000). This definition distinguishes between work-related stress complaints, work-related adjustment disorder, and burnout. Patients who had been diagnosed with either work-related adjustment disorder or burnout were included in our studies.

Several studies were conducted in order to answer the following five research questions: 1) Is work-related stress associated with dysregulation of the physiological systems involved in stress-responses?; 2) Can different phases in the process of physiological stress-adaptation be distinguished?; 3) Is CBT an effective treatment for work-related stress?; 4) What are predictors of recovery?; and 5) Is alexithymia, representing a cluster of deficiencies in emotion-processing, a vulnerability factor or a consequence of work-related stress?

With regard to the first research question, it was hypothesised that work-related stress would be associated with changes in main physiological stress sub-systems, that is, the sympathetic system (including the Sympathetic-Adrenal Medullary [SAM] axis), the parasympathetic system, the Hypothalamic Pituitary Adrenocortical (HPA) axis, and the immune system. Our hypothesis followed from stress-process models, including McEwen and Wingfield's (2003) model and Olf's (1999) model, that state that prolonged exposure to stressors results in physiological adaptations. Physiological adaptations can appear as changes in basal activity or changes in reactivity to, and recovery from, an acute stressor. In our studies, we compared patients absent from work because of work-related stress complaints with healthy individuals on cardiovascular, neuroendocrine, and immune measures (Chapters 2 – 4). Participants were exposed to a psychosocial stressor in the laboratory. We studied between-group differences in physiological basal activity, reactivity, and recovery, and in immune regulation by the HPA axis. Indications were found for changes in the balance between sympathetic and parasympathetic activity, resulting in an enhanced sympathetic tone among patients. We also found support for reduced HPA axis reactivity and for changes in immune regulation suggesting resistance to glucocorticoids.

The second research question, i.e., whether different phases in the physiological process of long-term adaptation to exposure to stressors can be distinguished, emerged from McEwen and Wingfield's (2003) model, which states that physiological adaptation is contingent upon the duration of

stressor exposure. We compared patients with a non-chronic and chronic history of work-related stress complaints on cardiovascular measures (Chapter 8). Cross-sectional and longitudinal comparisons were made. Consistent with Julius' (1993) model about the development of hypertension we hypothesised that the earlier stage of work-related stress would be characterised by a more dominant cardiac sympathetic tone, while a more progressed stage would be characterised by an enhanced vascular tone. Non-chronic stress was associated with a cardiovascular profile that was characterised by cardiac sympathetic dominance, which, as stress duration increased, changed into a cardiovascular profile that was characterised by enhanced vascular activation. Hence, findings indeed supported presence of different phases in cardiovascular adaptation to exposure to stressors.

The third research question was whether CBT would result in superior reduction of complaints, more work resumption, and more physiological improvement as compared to care as usual. In Lazarus and Folkman's (1987) model, psychological processes such as appraisal and coping mediate the relation between stressors and emotional and physiological reactions. Hence, it was hypothesised that influencing appraisal and coping through CBT may improve emotional and physiological conditions associated with work-related stress. Moreover, in non-clinical samples CBT was shown to be effective (van der Klink, Blonk, Schene & van Dijk, 2001). To assess the effectiveness of CBT in case work-related stress was more severe, we conducted a randomised controlled trial in which two CBT-conditions, i.e., individual CBT and group-CBT, were compared to care as usual (CAU; Chapters 5 – 7). CBT consisted of 12 sessions. Support was found for superior effectiveness of individual CBT on complaints in patients with less depressive complaints and for superior effectiveness of group-CBT on cortisol.

The fourth research question, i.e., what are predictors of recovery?, arose from the notion that little is known about the process of recovery. In addition, in treatment-effect studies, reduction of work-related stress complaints and work-resumption, two indicators of recovery, appeared to be rather independent processes (e.g., Bakker et al., 2007; Blonk, Brenninkmeijer, Lagerveld & Houtman, 2006). Hence, we conducted a longitudinal prediction study over a period of 13 months in which the predictive power of individual-related, work-related, and illness-related variables on reduction of work-related stress complaints and work-resumption was investigated (Chapter 9). Reduction of work-related stress complaints was predicted by individual-related predictors (i.e., male gender, higher education, lower age, and less avoidant coping), work-related variables (i.e., a lower number of hours working per week, less decision authority, more co-worker support, and more job-security), and an illness related factor (i.e., a shorter duration of sickness leave). Some of the predictors, e.g., coping and co-worker support, can serve treatment purposes. Other predictors, for example gender, age, and education, are more suitable for prognostic purposes. Work-resumption was only predicted by a lower age and by a reduction of burnout complaints. No mediation of reduction of burnout complaints in the association between age and work-resumption was observed. This finding further confirms that reduction of work-related stress complaints and work-resumption are partly independent processes.

The fifth research issue, i.e., whether alexithymia is a vulnerability factor or a consequence

of work-related stress, was addressed in an attempt to reveal a personality-related risk factor for work-related stress. We hypothesised that alexithymia would be related to work-related stress since abundant evidence is present for associations between alexithymia and mood disorders (e.g., Sayer, Kirmayer & Taillefer, 2003), anxiety disorders (e.g., Marchesi, Brusamonti & Maggini, 2000), and somatoform disorders (e.g., Duddu, Isaac & Chaturvedi, 2003). We conducted a longitudinal study including a patient sample with work-related stress complaints and a healthy reference sample (Chapter 10). We investigated the stability of alexithymia and examined the state-dependence of alexithymia. No convincing evidence for alexithymia being a risk factor for the development of work-related stress was obtained, since a) stability of alexithymia was lower in the patient group than in the healthy reference group and b) alexithymia levels in the patient group appeared to be highly state dependent. We concluded that alexithymia can best be understood as a reaction to a stressful situation.

The following main methodological issues with respect to this thesis deserve consideration: sample characteristics, design-related topics, the operationalisation of the construct work-related stress, and the operationalisation of the acute stressor. Regarding sample characteristics, our patient sample consisted of employees of small- to medium-size companies who were on sickness leave, which puts limits on the generalisation of for example the treatment outcome results to employees of larger companies and to healthier samples. Second, our sample was heterogeneous with respect to the dominant type of complaints (i.e., depression-, anxiety-, or fatigue-related) and the duration of complaints. While heterogeneity on the one hand resulted in large inter-individual variation in physiological measures that may have handicapped the detection of main effects, it also suggests that the sample was naturalistic, strengthening external validity of our studies.

A general design issue is the fact that we performed various studies using the same patient sample. This had clear practical advantages; it for example reduced the effort for sample recruitment. A drawback, however, may be the risk of over-generalisation due to overweighing repeatedly observed patterns in the results that are caused by typical characteristics of this sample instead of typical characteristics of work-related stress. Other design issues are specific to the treatment effect studies. First, the control group received care as usual. A limitation of this design is that we could test the relative but not the actual effectiveness of CBT. Hence, our overall null-findings suggest that CBT merely did not outperform care provided by the occupational physician and short psychological treatments. Future research may address the question whether both or neither treatments are effective in treating work-related stress. A strength of our design is, however, that care as usual is a credible and naturalistic control treatment. Second, the size of the patient sample enabled us to detect only medium to large differences between conditions, while in retrospect it seems more likely that the actual differences between supposedly active interventions will be in the small to medium range.

Concerning operationalisations, a general issue is our choice for the definition of work-related stress as work-related adjustment disorder or burnout (Netherlands Society of Occupational Medicine, 2000). As a consequence, we did not consider potential qualitative differences between the two conditions. While our one-dimensional approach of work-related stress is in accordance with the

newest guidelines of the Netherlands Society of Occupational Medicine (2007), future research addressing this conceptualisation is required. With regard to the studies about the acute physiological stress response, consideration of the operationalisation of the acute stressor is requested because of the limited evidence for between-group differences in physiological reactivity. The use of a camera instead of a live audience in the psychosocial stressor may have resulted in attenuated physiological stress responses, which may have impaired the detection of physiological differences between patients and healthy individuals, and between treatment conditions. However, the use of a camera instead of a live audience also had practical advantages regarding for example standardisation. Furthermore, in retrospect, our psychosocial stressor may have been too much achievement-oriented. Consequently, the stressor may have been suboptimal to elicit physiological stress responses in women, hindering detection of physiological changes in acute reactivity and recovery among them.

Our project has several clinical implications. First, the finding that a substantial number of patients demonstrated pre-hypertensive diastolic and borderline hypertensive systolic blood gives rise to close monitoring of blood pressure. Second, the presence of a particularly adverse cardiovascular profile in a subgroup of the chronic patients with work-related stress suggests that information about the phase of cardiovascular adaptation is important for treatment and reintegration purposes. Third, the modest association between self-reported work-related stress complaints and physiological measures warrants inclusion of both self-report and physiological measures in clinical assessments. Fourth, routine prescription of CBT for patients on sickness leave because of work-related stress is not indicated. CBT may, however, be beneficial for certain subgroups, for example, those characterised by relatively low levels of depressive complaints. This suggestion awaits further cross-validation, though. Fifth, the loose association between reduction of work-related stress complaints and work-resumption in the recovery process suggests that either outcome requires its own intervention strategy. And sixth, as the prevalence of primary alexithymia observed among patients with work-related stress was similar to the prevalence in the general population, our study gives no rise to adapt standard CBT protocols for work-related stress.

Research within the field of work-related stress faces diverse challenges. First, further clarification of the nature and development of physiological dysregulation associated with work-related stress is needed. To meet this challenge, we recommend that future studies take into account subgroups based on predominant complaints and duration of complaints, and include measures regarding duration of stressor exposure and presence of a stressor. We also suggest exploring the use of an acute stressor that may be more relevant for women in order to study changes in their physiological adaptation to stress. Furthermore, identification of genetic risk profiles may add to reaching this goal. Second, we need to the discrepancy between physiological characteristics and self-reported work-related stress complaints. To clarify this issue we suggest assessing sources of incongruence and examining the effect of synchronisation of measurement of the two variables. Third, specific treatments for work-related stress need to gain in efficacy. To work towards this aim, we propose to explore the effectiveness of treatments targeted at the individual and the workplace, because such a treatment format may do more justice to the presumed interactional nature of work-related stress

(Maslach, Schaufeli & Leiter, 2001). In addition we suggest investigating the potential moderating effect of depressive complaints. Fourth, there is a need to enhance insight in the process of recovery of work-related stress. To advance on this topic, we recommend assessing mediation models including repeatedly measured relevant coping strategies, cognitions, and actions aimed at recovery and reintegration undertaken by the caregivers and employer. And fifth, we need to further improve the conceptualisation of work-related stress. This challenge may be addressed by assessing whether work-related adjustment disorder and burnout represent qualitatively different disorders or should instead be viewed as work-related stress disorders of different severity.

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