

# **Chapter 1**

**Introduction and outline of the thesis**

Stress at work and its negative impact on the health status of employees are major problems for modern societies. A survey of the European Union's member states found that 28% of employees reported stress-related illness or health problems. This accounts for 41 million EU workers<sup>1</sup>.

Why is work such an important determinant of peoples well-being? Most adults spend a large part of their daily life at work. Consequently, conditions in the workplace are likely to be an important determinant of mental health as well as physical well-being. Work has a central role in people's lives and a satisfying job may contribute to a more meaningful life, a higher self-esteem and economic independence. Individuals who work report a higher quality of life than those who do not (Ruchlin & Morris, 1991) and full time employment predicts slower declines in perceived health and in physical functioning for both men and women (Ross & Mirowsky, 1995). Social and technical modernisation followed by globalisation has caused a polarisation of the labour market in economically advanced societies. On the one hand, unemployment is a pressing problem because not enough jobs are available on the labour market or people have only insufficient education. For these individuals stress results from financial insecurity as well as understimulation (Lundberg, 2007). On the other hand, many people experience stress because they are exposed to high demands at work and to hard competition due to downsizing efforts and an increased need for efficiency. Work related stress is very costly for societies, leading to increased absenteeism, a higher employee turnover, diminished productivity, more accidents as well as to direct medical, legal and insurance costs. In 1993, German employers for example paid up to 60 billion DM for social security insurance to cover the pay of absentee

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<sup>1</sup> according to the *Third European Survey on Working Conditions (2000)*, European Foundation for the Improvement of Living and Working Conditions. Dublin, Ireland.

workers<sup>2</sup>. Thus, the financial implications of work stress alone should arouse public interest and it should be a major goal of all involved parties (governments, employers, employees, and insurance companies) to reduce absenteeism and ill health caused by stress at work.

Although there is growing research activity linking chronic work stress and the modern work environment with specific health outcomes, not much attention has yet been paid to the psychoneuroendocrinological processes that may underlie these links. The stress response has evolved as a highly adaptive reaction to ensure survival when an organism is confronted with a physical or psychological challenge. However, the same processes that are adaptive under acute stress conditions, may ultimately promote disease development when occurring chronically (Chrousos, 1998; Tsigos & Chrousos, 2002; McEwen, 2007). Previous work has implicated two main pathways through which stress can impact on physical health. On the one hand stress can influence people's health behaviour, like smoking, choice of diet, exercise or adherence to medical treatment and on the other hand stress can directly initiate unfavourable alterations in endocrine and immune function, thereby increasing an individual's vulnerability to a range of physical diseases. The aim of the present thesis was to investigate the physiological effects of work-related stress in school teachers in order to better understand the mechanisms by which such stress may lead to ill health. This population was selected because teaching has been proposed to be a highly stressful occupation, with enhanced levels of psychosocial stress experienced in the workplace (Guglielmi & Tatrow, 1998; Kyriacou, 2001; Weber et al., 2001).

By integrating the methodologies of work psychology, health psychology, psychosomatic medicine and psychoneuroendocrinology, this work has primarily sought to enhance our understanding of how chronic work stress and the consequences of such stress, may relate to various health problems.

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<sup>2</sup> numbers based on the European Research Report, 1997, *Preventing Absenteeism at the Workplace*.

The general introduction in **Chapter 1** gives a brief overview of the thesis and the research rationale behind the Trier Teacher Stress Study. **Chapter 2** summarizes important theoretical concepts that underpin the present work. Furthermore, an introduction into the physiology of the stress response as well as the applied research tools is provided. Finally, a review of the current literature regarding the impact of burnout and exhaustion on the regulation of the hypothalamus-pituitary-adrenal (HPA) axis, allostatic load and the particular stressors and demands of the teaching profession is given. In the following three chapters my own empirical findings on the relationships between work-related stress, burnout and exhaustion, and alterations in different physiological systems are presented. The Trier Teacher Stress Study was conducted under the supervision of Prof. Dr. Brigitte Kudielka-Wüst and Prof. Dr. Dirk Hellhammer. I have written three independent manuscripts that have been submitted for publication in different scientific journals. They are presented in this thesis such that each is self-contained, with its own introduction, methods, results and discussion sections, to allow readers to access individual parts of the thesis without recourse to the whole document. Because not all of the assessed parameters could be investigated in every subject, the number of subjects differs slightly in the three sets of results. In **Chapter 3**, evidence is provided that burnout, exhaustion and low reward from work all appear to be associated with subtle HPA axis dysregulation. This dysregulation was not reflected in cortisol day profiles but manifested as heightened HPA axis negative feedback.

**Chapter 4** presents data supporting the hypothesis that chronic work stress, reflected in effort-reward-imbalance and exhaustion is associated with changes in a multi-system summary indicator of physiological risk, called allostatic load. In **Chapter 5** the impact of chronic work stress, in terms of effort-reward-imbalance and overcommitment on responses to acute psychosocial stress is scrutinized. This data supports the concept of HPA axis hyporeactivity being present in highly overcommitted school

teachers. **Chapter 6** provides a general discussion, with the aim of integrating the presented findings, followed by a brief discussion of potential future research directions.

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