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Nine-Year Longitudinal Psychosocial and Mental Outcomes of a Stress Management Intervention at Work Using Psychotherapeutic Principles

Jian Li[a], *Natalie Riedel*[c], *Amira Barrech*[a, d], *Raphael M. Herr*[a, e], *Birgit Aust*[f], *Kathrin Mörtl*[g], *Johannes Siegrist*[b], *Harald Gündel*[d], *Peter Angerer*[a]

[a]Institute of Occupational, Social and Environmental Medicine, Centre for Health and Society, Faculty of Medicine, and [b]Senior Professorship on Work Stress Research, Life-Science Centre, University of Düsseldorf, Düsseldorf, [c]Department of Social Epidemiology, Institute of Public Health and Nursing Research, Health Sciences Bremen, University of Bremen, Bremen, [d]Department of Psychosomatic Medicine and Psychotherapy, Faculty of Medicine, University of Ulm, Ulm, and [e]Mannheim Institute of Public Health, Social and Preventive Medicine, Medical Faculty Mannheim, Heidelberg University, Mannheim, Germany; [f]National Research Centre for the Working Environment, Copenhagen, Denmark; [g]Department of Psychotherapy Science, Sigmund Freud Private University, Vienna, Austria

Prolonged psychosocial stress at work has been shown to be a risk factor for ill health, particularly mental disorders, as well as for productivity loss and economic burden. Consequently, stress management interventions (SMI) in the workplace have received increasing attention from researchers as well as employers and employees [1]. Generally, SMI at the individual level with the largest effects on mental health are based on psychotherapeutic principles, mostly cognitive-behavioral therapy and psychodynamic therapy. The long-term effectiveness, i.e., over a period of up to 10 years, of different types of psychotherapy on common mental disorders has been recently confirmed in clinical settings [2]. Respective evidence in occupational settings is still lacking today. SMI in the workplace could best be based on theoretical models that include a personal as well as a situational component of intervention. The Effort-Reward Imbalance (ERI) model [3] is one such model that has been used to guide intervention studies in recent years [4–7]. The ERI model includes the situation-specific component, which emphasizes the harmful effects of failed reciprocity between efforts spent at work and rewards received in turn (high effort/low reward), and the person-specific component termed 'overcommitment', which is a distinct pattern of coping with demanding situations characterized by an inability to withdraw from work obligations. However, current knowledge concerning SMI at work is restricted to short- or medium-term evaluations, usually of weeks, but of no more than 3 years [1]. Therefore, there is reason to assume that a theory-driven individual-level SMI in the workplace (as with the ERI model) that draws on psychotherapeutic techniques may have sustained effects on psychosocial work stress and mental health over a prolonged period of time, i.e., several years.

We conducted an individual-level SMI at work in Germany in terms of a randomized controlled trial with a 1-year follow-up period. The results showed this SMI to be effective in improving stress management abilities (a reduction of perceived stress reactivity) and additionally demonstrated a tendency towards a reduction of psychosocial work stress and an improvement in mental health. Importantly, this SMI was the first where psychodynamic principles and cognitive-behavioral techniques were applied together in the occupational setting, and it was explicitly based on a stress-theoretical model (ERI) addressing the situational (high effort/low reward) and personal (overcommitment) aspects of sustained stress experience [details in 7]. In order to determine the effects of this SMI in the workplace 9 years after its initiation (2006), we conducted a follow-up survey.

Here we report the long-term effectiveness on psychosocial work stress and mental health. Briefly, in 2006, 174 eligible participants (male industrial managers with middle-level leadership positions) were randomized after the initial evaluation into an intervention group or a wait-list control group. The intervention group was offered an SMI in 2007, and the control group received the same SMI in 2008. Two surveys were conducted after the SMI training, in 2007 (n = 154) and in 2008 (n = 131), respectively. We conducted a follow-up survey in 2015. In total, 94 participants who had completed all the questionnaire surveys were included. The dropout analyses showed that the final sample was not significantly different from the dropout sample in terms of sociodemographic, psychosocial and mental data (not shown). In this study, psychosocial work stress as the primary outcome and depression and anxiety as the secondary outcome were repeatedly measured by the standard Short-ERI questionnaire [8], and the Hospital Anxiety and Depression Scale (HADS) [9], respectively.

Given the fact that both the intervention group and the wait-list control group received the SMI, these groups were merged in order to increase statistical power for the follow-up analyses, independent of the timing and amount of SMI they had received (intention-to-treat). Three time points were selected: preintervention (2006), postintervention (2008) and posttrial follow-up (2015). Firstly, a repeated-measures analysis of variance across the 3 time points was performed, and we found that results were significant ($p < 0.05$) for all indicators of psychosocial work stress

E-Mail karger@karger.com
www.karger.com/pps

Peter Angerer
Institute of Occupational, Social and Environmental Medicine
Centre for Health and Society, Faculty of Medicine, University of Düsseldorf
Universitätsstraße 1, DE–40225 Düsseldorf (Germany)
E-Mail peter.angerer@uni-duesseldorf.de

Table 1. Psychosocial work stress and mental health changes from 2006 to 2015 among 94 study participants

Variables	2006 (preintervention)	2008 (postintervention)	2015 (posttrial follow-up)	Preintervention/ postintervention differences	Postintervention/ follow-up differences
Psychosocial work stress					
E-R ratio	0.74±0.23	0.61±0.28	0.62±0.25	–0.13±0.29***	0.02±0.31
Effort	8.67±1.78	7.71±2.40	7.91±2.49	–0.96±2.22***	0.18±2.78
Reward	28.65±4.93	31.18±4.71	30.85±4.81	2.57±5.59***	–0.34±5.20
Overcommitment	13.98±3.64	12.83±3.42	13.44±3.92	–0.98±3.59*	0.63±3.60
Mental health					
Depression	4.62±3.24	3.37±2.85	4.64±3.91	–1.24±2.89***	1.26±3.72***
Anxiety	6.21±3.17	4.82±2.93	5.92±3.72	–1.39±3.23***	1.10±3.79**

Values are expressed as mean ± SD. Paired t test. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

and mental health (data not shown). Then, the differences of psychosocial work stress and mental health between preintervention and postintervention (2006–2008) and between postintervention and posttrial follow-up (2008–2015) were analyzed using the paired Student t test. As seen in Table 1, psychosocial work stress sharply decreased during the intervention period (2006–2008), the imbalance between effort and reward (E-R ratio) dropped from a mean value of 0.74 to 0.61 ($p < 0.001$), and the mean score of overcommitment declined from 13.98 to 12.83 ($p < 0.05$); during the posttrial follow-up (2008–2015), these values remained relatively unchanged. The data therefore suggest both short- and long-term effectiveness of this intervention on psychosocial work stress. The pattern of depression and anxiety was somewhat different. Here, we observe a sharp decrease during the intervention period ($p < 0.001$), but an increase during the posttrial follow-up that reached almost the preintervention level. The mechanism for the changes in mental outcome was not evident. Age effect might be considered, given that mental disorders measured by HADS are continuously increasing with age in the general German population [10]. Our SMI focused on the identification and solving of work stress problems rather than mental problems, and there are many other risk factors beyond work stress that influence the mental status, so the effect on work stress after 9 years appears more pronounced than that on mental outcomes.

To the best of our knowledge, this is the first SMI study based on a stress-theoretical model and conducted in an occupational setting covering a period of 9 years. Previous ERI-based intervention studies at the individual level reported on much shorter follow-up periods. Mino et al. [4] conducted a 3-month, randomized controlled trial in Japan with significant effects on depression. Two further randomized controlled trials in Germany found effects of SMI on work stress and burnout over a period of 6 months [5] or 1 year [6]. Importantly, our study, using psychodynamic principles together with cognitive-behavioral techniques, documented a significant improvement in psychosocial stress and mental health at work, thus extending the research findings of long-term effectiveness of psychotherapy on common mental disorders from the clinical to the occupational setting [2].

However, several limitations need to be taken in account. First, our SMI did not include organizational-level measures. It has been suggested that SMI in the workplace combining both organizational and individual levels might be more effective [1]. Thus, our results may have underestimated the potential benefits. Second, due to the research design of a wait-list controlled trial, no internal control group was available for comparison at the time of the follow-up survey. Thus, we could only examine longitudinal differences across several time points within the study sample. Third, due to a high prevalence of males in this branch of industry, we cannot generalize the findings to working women or to other occupational groups. Finally, even though we had no indication that the final sample participating in all surveys over 9 years was significantly different from the initial sample, the healthy worker effect could not be ruled out. Workers with high levels of work stress and/or severe mental disorders might not have been followed up, due to long-term absence for sickness or even an exit from the labor market. Clearly, more research is warranted to be able to better understand and confirm the long-term effectiveness of SMI in the workplace and promote a healthy and productive work environment.

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