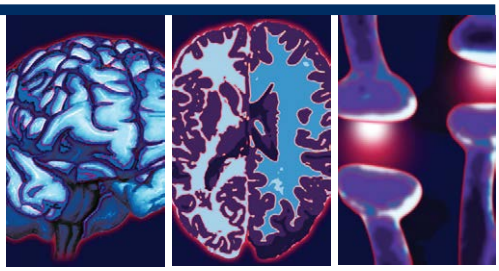
Research



Gender Differences in Different Dimensions of Common Burnout Symptoms in a Group of Clinical Burnout Patients

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ABSTRACT

Objective: The current study investigated gender differences with a focus on mood, personality characteristics, sleepiness/alertness and cognitive measures in a group of 103 clinically diagnosed burnout patients, who were enrolled in a five week rehabilitation program in specialized centers in Austria.

Methods: Patients completed a series of questionnaires measuring mood, burnout symptoms, sleep complaints and personality characteristics such as work-related coping. Additionally, all subjects were assessed with a cognitive test battery measuring specific components of executive functions and selective visual attention. Furthermore, to evaluate if gender differences generalize across potential burnout subgroups we performed a cluster analysis with the depression score and burnout-index as clustering variables.

Results: Our results revealed, that men and women did not differ in their depression scores, but women showed higher levels in emotional exhaustion and reduced vitality as well as reduced vigilance compared to men. Moreover, women showed higher levels of sleepiness and tiredness that also affected cognitive performance of more demanding executive control tasks. Finally, we found gender differences in personality characteristics and work-related coping strategies. Men and women were equally distributed across all three burnout subgroups identified with cluster analysis, and gender differences were the same in all burnout subgroups.

Discussion: The observed gender differences in clinical burnout patients may have implications for the development of gender-specific rehabilitation programs.

Keywords:

Burnout, Gender differences, Cognition, Mood, Sleep

Introduction

In the last century our society has changed significantly. Dramatic shifts in gender roles, family structures and work-related demands have important implications for the types of stressors men and women face, and ultimately for their health and well-being. Today as many as one in four Europeans are affected by mental health problems each year and overall work-related

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stress is now thought to affect one third of the workforce [1]. Gender differences are observed in a wide range of stress-related disorders, for example women are twice as likely to become depressive leading to a higher rate of sick-leave, disability and early retirements in female employees (for a review see [2]). There is growing evidence that men and women do not only perceive stress differentially but also respond to stress physiologically in different ways and individual differences in stress reactivity have been proposed as a potentially important risk factor for gender-specific health problems such as depression (for a review see [3]).

The majority of research on employees with work-related chronic stress complaints has been conducted under the label burnout, although there is no consistent definition of burnout, and the diagnosis is not included in the Diagnostic and Statistical Manual of Mental Disorders [4] and in the International Statistical Classification of Diseases and Related Health Problems [5] burnout is only briefly mentioned among the factors influencing health status and contact with health services (Z73.0). In 2017 a study by the Federal Ministry of Labour, Social Affairs, Health and Consumer Protection in Austria reported a prevalence rate of the burnout syndrome of 8 % in a sample of 1004 working adults [6]. However, previous studies found a wide range of burnout prevalence rates from 2,5% to 50%, depending on methodological heterogeneities between studies such as different assessment tools or population characteristics (e.g. professions), nevertheless on average, 29% of the adult working population were estimated to be at risk for a burnout and 9.2% showed a manifest burnout syndrome [6]. Generally, the term burnout is mulitfaceted and is characterized as a chronic affective state resulting from cumulative exposure to job-related stressors. According to Maslach and coworkers [7-12] work-related burnout consists of three dimensions namely emotional exhaustion, depersonalization/ cynicism and feelings of reduced professional efficacy. Demographic variables (e.g., age, job status), personality characteristics (e.g., trait anxiety), coping strategies as well as job demands may facilitate the onset of burnout (for review see [13]) which, in turn, has been linked to mental and physical health problems such as depression, sleep disturbances and somatic symptoms (e.g., cardiovascular disease) [14].

Since various moderating factors may affect the relationship between burnout and gender, the literature has produced inconsistent results, with some studies showing higher prevalence of burnout in women [15-17] whereas others reported higher prevalence rates in men [18] or no sex differences [19]. So far, most studies used the Maslach Burnout Inventory (MBI) to study gender differences in burnout (for a review see [20]) and a meta-analysis demonstrated that women score higher on emotional exhaustion, while men score higher on depersonalisation, although effect sizes were moderate [20].

Especially impairment in cognitive performance ability might be a mediating factor between burnout and reduced work performance. Chronic work stress has previously been associated with subjectively reported deficits in cognitive performance [21] as well as objectively measured cognitive deficits [22]. A strong association between burnout and deterioration in three major cognitive systems, namely the executive, attentional and memory systems was suggested by Deligkaris *et al.* [23]. Previous studies used a variety of cognitive measures to assess executive functions and working memory deficits, however the exact nature of the impairment (i.e., a more general deficit in cognitive processing such as a slower reaction time or specific deficits in executive subdomains such as updating, inhibition or switching) still remains unclear. An important factor that contributes to the inconclusive results might be that previous studies did not control for comorbid psychopathologies such as depression or current sleepiness and fatigue, which are independently associated with cognitive performance dysfunctions ([e.g. 24-29]). Another possible reason for the underestimation of cognitive deficits in burnout symptoms might be due to underrepresentation of more severe burnout cases in the samples, especially in studies that used non-clinical samples of participants who were still working or had returned to a part-time schedule [e.g. 30-31]. Oosterholt *et al.* [32] showed that clinical burnout patients reported more severe cognitive problems than individuals with nonclinical burnout, and objectively impaired cognitive test performance was only found in the clinical burnout patients.

The aim of the present study was to examine gender differences in a group of clinically diagnosed burnout patients. We focused on gender differences in several factors that are interdependent in burnout patients such as mood and personality characteristics, sleepiness/ alertness measures and cognitive measures. Since

deficits in executive functions might not only be related to work performance but also to the success of rehabilitation in burnout patients, we used different cognitive tasks to measure selective attention and executive control. Most importantly, we controlled for comorbid psychopathologies such as depression and fatigue, which are independently associated with compromised executive functions.

Since previous studies suggested that burnout patients are not a homogeneous, distinct group, but rather overlap with other disorders such as depression [33-34] we additionally conducted a cluster analysis to examine the link between depression and burnout and to evaluate if gender differences in the assessed variables generalize across potential burnout subgroups characterized by different levels of burnout and depression severity.

Methods

■ Participants

In the present study 136 patients with a clinical burnout diagnosis were asked to participate in the study. Due to their burnout symptoms all subjects were enrolled in a five week rehabilitation program in two specialized centers in Austria and all patients were on sick leave for at least one week before admission. Burnout diagnosis was established by a team of psychiatrists and clinical psychologists and was based on the criteria for ICD-10 work-related neurasthenia [5], which has been proposed as the psychiatric equivalent of clinical burnout [35]. Following recommendations of previous studies [32,34] we included only patients that scored ≥ 2.20 on exhaustion and either ≥ 2.00 on cynicism or ≤ 3.67 on professional efficacy in the MBI-GS. Seventeen patients refused to participate in the study or subsequently decided to withdraw from the research. Twelve patients were lost because they failed to complete the rating scales or the cognitive testing. Four patients had to be excluded because they did not meet the inclusion criteria (MBI-GS cut off score: emotional exhaustion score ≥ 2.20 and either cynicism score ≥ 2.00 or professional efficacy score ≤ 3.67). The final sample consisted of 103 clinical bunrout patients (66 women, 37 men). All data were collected during the end of the first week of the rehabilitation program.The study was in accordance with the 1964 Declaration of Helsinki and was approved by the Ethics Committee of the University of Graz, Austria, and informed written consent was obtained from all patients prior to participation.

Measurements

■ Mood and personality characteristics

Beck Depression Inventory (BDI; [36]): The BDI is a 21-item self-report scale that covers a variety of depressive symptoms along a continuum from 0 (absent or mild) to 3 (severe). The total score is computed by summing up all items.

Maslach Burnout Inventory (*MBI-GS-D: Version for general professions* [37], *German version* [38]): The MBI-GS-D contains 16 items, scored on a 6-point Likert scale (1="never", 6="very often") and grouped in three dimensions. The emotional exhaustion scale consists of five negatively worded items (e.g., "I feel burned out from my work"). The cynicism/depersonalization scale includes five negatively worded items (e.g., "I have become less interested in my work since I started this job"), and the personal accomplishment scale consists of six positively worded items (e.g., "I feel confident that I am effective at getting things done"). Since all subjects were on sick leave during the test administration, they were instructed to fill in the items of the MBI-GS-D according to how they would feel if they were working at that moment.

Basler Well-Being Questionnaire (BBS [39]): The BBS is a standardized, German questionnaire for the assessment of current well-being. Participants indicate how the feel on a 7-point scale spanning between two bipolar adjectives (e.g., Right now, I feel calm….nervous; 16 items in total). Items are grouped into four factors representing the sums of the scores over all items within the factor. The four factors are (1) *vitality,* referring to mental and physical vigor, (2) *intrapsychic balance,* describing mental balance, (3) degree of *social extraversion,* referring to the ability and willingness to form social contacts, and (4) *vigilance*, referring to the ability to direct one's attention to something new.

Dynamic Sequences of Behavior (DSB [40]): The DSB consists of two factors (burnout and inner withdrawal). In this study an adapted version with five subscales ("Other people's expectations", "Sense of security", "Dysfunctional beliefs/attitudes", "Dysfunctional time management", "Sense of control") and 25 items was used. The items of the DSB refer to critical dysfunctional strategies in stressful situations (e.g., „In the last seven days

. . . I accepted additional tasks because I was afraid of being less important"). The statements have to be answered on a 7-point Likert scale ranging from "never" (0) to "always" (6).

■ Sleepiness/Alertness Measures

Tiredness Symptom Scale (TSS [41]). The TSS is a 14-items checklist with physical and mental symptoms associated with tiredness (e.g., heavy head, general weakness) which have to be answered with "yes" or "no". The total TSS score ranges from 0 to 14.

The Stanford Sleepiness Scale (SSS [42]). The subjects rate their current level of sleepiness on a 7-point scale ranging from 1 ("feeling active and vital; alert; wide awake") to 7 ("almost in reverie; sleep onset soon; lost struggle to remain awake").

■ Cognitive measures

The *d2 test* [43] measures selective visual attention and mental concentration. In this paper and pencil test participants are required to cross out the letter d with two dashes out of 14 lines of letters. Distractive items are d's with one, three or four marks and p's with any number of marks. The number of correctly crossed out letters served as measure of concentration performance.

TEMEKKO (Test for the assessment of executive control and concentration; [44]). The TEMEKKO measures executive control and consists of three subtests with verbal, numerical, and figural content. Each subtest has two parts with 190 items per subtest. Each item consists of a box with three concepts, numbers, or bars. The participants had to cross out concepts, numbers, and bars which were ascending or descending (e.g., 5 2 1, "louse", "chair", "house", wich were ascending in size as well as ▪ ■ ■). To distract participants while finding out ascending and descending concepts, numbers, and bars, they randomly varied in distance, size, layout (bold face or not), and position (superscript or not). The test scores are the sum of correctly crossed out boxes with ascending or descending concepts, numbers, or bars during 14 minutes. Reliability was confirmed in several studies (*rtt* =.93 to *rtt* =.97); [44].

■ Statistical analyses

Demographical characteristics of male and female patients were compared by means of t-tests and Pearson's chi-square tests (Table 1). Gender differences with respect to mood/personality characteristics were investigated by means of three multivariate analyses of variance (MANOVAs) using the three dimensions of the MBI, the four factors of the BBS and the five scales of the DSB as dependent variables, respectively. Differences in sleepiness/fatigue were tested with a MANOVA using the TSS and SSS as the dependent variables. Differences in cognitive performances between men and women were tested using a MANOVA with the three scales of the TEMEKKO as the dependent variables, and one ANOVA using the d2 score as the dependent variable. To test whether sex differences in cognitive performance may be moderated by depression (BDI) and / or sleepiness (SSS), the relevant interactions were tested by entering the latter variables as continuous between-subjects variables in respective ANOVAs.

Similar to the study of Bianchi and Schonfeld [33] we used cluster analysis with a global burnout index (z-score of the combined MBI-GS subscales exhaustion and cynicism) and depression score (z-score of the BDI) as the clustering variables to examine the link between depression and burnout. First, a hierarchical agglomerative cluster analysis with Ward's method as a linkage method and squared Euclidean distance as a similarity measure was conducted. The optimal number of clusters was determined by the dendrogram, which is a visual illustration of how the individual cases are arranged into the clusters produced by hierarchical clustering. Next, a K-means cluster analysis was conducted to improve the cluster fit [45]. The analyses of variance then were repeated with cluster as an additional between-subjects variable, in order to evaluate if gender differences in the assessed variables generalize across burnout subtypes characterized by different levels of burnout and depression severity.

Estimates of effect sizes are reported using partial eta-squared (η_p^2). All statistical tests were performed with $\alpha = .05$ (two-tailed).

Results

Demographic data are presented in Table 1. No significant differences between men and women were found for age, education, sick-leave days, depression-score (BDI) and frequency of taking psychotropic medication. Men showed a significant higher amount of work hours per week than women (Table 1).

■ Mood and personality variables

The MANOVAs showed significant gender

Table 1: Demographic Characteristics.

	Men	Women		p
Age (years)	45.6 (6.8)	44.4 (8.8)	t(101) = 0.73	.467
Work hours per week	46.8 (12.0)	36.7 (16.4)	t(101) = 3.28	.001
Sick-leave days	129.8 (98.0)	133.7 (103.7)	t(101) = 0.19	.852
BDI	20.2 (10.8)	22.2 (9.2)	t(101) = 1.04	.302
[a]Level of education			$\chi^2(3, n=103) = 6.5$	.091
1	8%	9%		
2	54%	30%		
3	22%	42%		
4	16%	19%		
Psychotropic medication	73%	82%	$\chi^2(1, n=103) = 1.1$	.293

Note: Means (standard deviations).[a]Level of education was measured in terms of highest level of education completed, ranging from 1 to 4, primary school to university degree, respectively.

differences for the MBI subscales (emotional exhaustion, cynicism/depersonalization, personal accomplishment): F(3,99) = 3.9, p = .012, η_p^2 = .11; the BBS: F(4,98) = 4.5, p = .002, η_p^2 = .15; and the DSB: F(5,97) = 2.7, p = .029, η_p^2 = .12). Subsequently univariate F-Tests for the MBI scales revealed that women reported higher levels of emotional exhaustion (F(1,101) =5.6, p=.02, η_p^2 = .05), but no significant gender differences emerged for cynicism/depersonalization (F(1,101) = 0.2, p = .661) and personal accomplishment (F(1,101) = .19, p = .667). Univariate tests of the BBS factors indicated reduced scores in vitality (F(1,101) = 14.6, p < .001, η_p^2 = .13) and vigilance (F(1,101)= 4.7, p = .03, η_p^2 = .05) in women and a trend towards a statistically significant reduced score for social extraversion (F(1,101) = 3.3, p = .07, η_p^2 = .03) in women. No sex differences were found for the factors intrapsychic balance (F(1,101) = 4.2, p = .518). Finally, women showed higher ratings on the DSB scales: "Other people's expectations" (F(1,101) = 5.1, p = .026, η_p^2 = .05) and a trend towards statistically significant higher ratings on the scale "Sense of security" (F(1,101) = 3.03, p = .085, η_p^2 = .03). No sex differences were found for the DSB factors "Dysfunctional beliefs/attitudes" (F(1,101)= 1.3, p = .252), "Dysfunctional time management" (F(1,101) = 0.5, p = .832) and "Sense of control" (F(1,101) = .2, p = .658). The means of the scales measuring general well-being and personality characteristics are shown in Table 2.

■ Sleepiness/Alertness Measures

The MANOVA yielded a significant result (F(2,100) = 3.2, p = .046, η_p^2 = .06). Univariate tests indicated higher scores in the Tiredness Symptoms Scale (F(1,101) = 5.0, p = .028, η_p^2 =.05) and the Stanford Sleepiness Scale (F(1,101) = 5.1, p = .026, η_p^2 =.05) in women compared to men. The means of the scales measuring sleepiness and alertness are shown in **Table 3**.

■ Cognitive measures

The MANOVA with the three subscales of the TEMEKKO indicated significant gender differences in executive control/concentration performance, with men scoring better than women in the figural and numerical subtests (F(3,99) = 6.4, p = .001, η_p^2 = .16; **(Table 3)**). Importantly, ANOVAs with sleepiness (SSS) and depression (BDI) as continuous between-subjects variables revealed that the gender differences in performance depended on sleepiness (interaction gender by sleepiness: figural, F(1,97) = 6.1, p = .016, η_p^2 = .06; numerical, F(1,97) = 3.9, p = .05, η_p^2 = .04; verbal, F(1,97) = 8.1, p = .005, η_p^2 = .08). There were no significant main effects of gender in these analyses (F(1,97) = 0.2, p = .63; F(1,97 = 0.2, p = .88; F(1,97) = 1.4, p = .24). Elaboration of the interaction effects by multiple regression analyses indicated than men outperformed women in the figural and numerical subtests only when sleepiness scores were high. Exemplarily, Figure 1 depicts estimated scores on the figural subtest in men and women with scores one standard deviation above and one standard deviation below on the Stanford Sleepiness Scale (Figure 1). The interaction looks very much the same for the numerical subtest. In the verbal subtest, the female advantage on the task observable when sleepiness was low was abolished when sleepiness was high (Figure 2). The findings are essentially the same when the tiredness score is used instead of the sleepiness score (interaction gender by sleepiness: figural, F(1,97) = 6.1, p = .015, η_p^2

Table 2: General well-being and personality characteristics in burnout patients.		
	Men	**Women**
Maslach BurnOut Inventar		
Emotional exhaustion *	4.8 (0.9)	5.2 (0.8)
Cynicism/Depersonalization	4.2 (0.9)	4.1 (1.1)
Personal accomplishment	4.6 (0.8)	4.5 (0.8)
Basler Well-Being Questionnaire		
Vitality *	4.2 (1.3)	3.2 (1.2)
Intrapsychic balance	4.4 (1.3)	4.2 (1.2)
Social extraversion	3.7 (1.5)	3.3 (1.2)
Vigilance *	4.4 (1.4)	3.8 (1.4)
Dynamic Sequences of Behavior		
Dysfunctional beliefs/attitudes	2.7 (1.7)	3.1 (1.5)
Time management	2.5 (1.3)	2.6 (1.3)
Other people's expectations *	2.8 (1.2)	3.4 (1.4)
Sense of security *	2.3 (1.4)	2.8 (1.2)
Sense of control	2.6 (1.2)	2.8 (1.4)
Note: M (SD); * p < .05		

Table 3: Scales for sleepiness/alertness and average concentration performance in burnout patients.		
	Men	**Women**
Sleepiness Scales		
Tiredness Symptom Scale *	4.5 (3.2)	5.9 (2.8)
Stanford Sleepiness Scale *	3.0 (1.3)	3.6 (1.3)
TEMEKKO		
Figural subscale *	40.3 (9.0)	36.3 (8.6)
Numercial subscale *	40.4 (13.0)	34.2 (11.5)
Verbal subscale	34.8 (8.9)	36.3 (8.2)
d2 test		
Concentration performance	367.73 (78.69)	380.34 (77.98)
Note: M (SD); * p < .05		

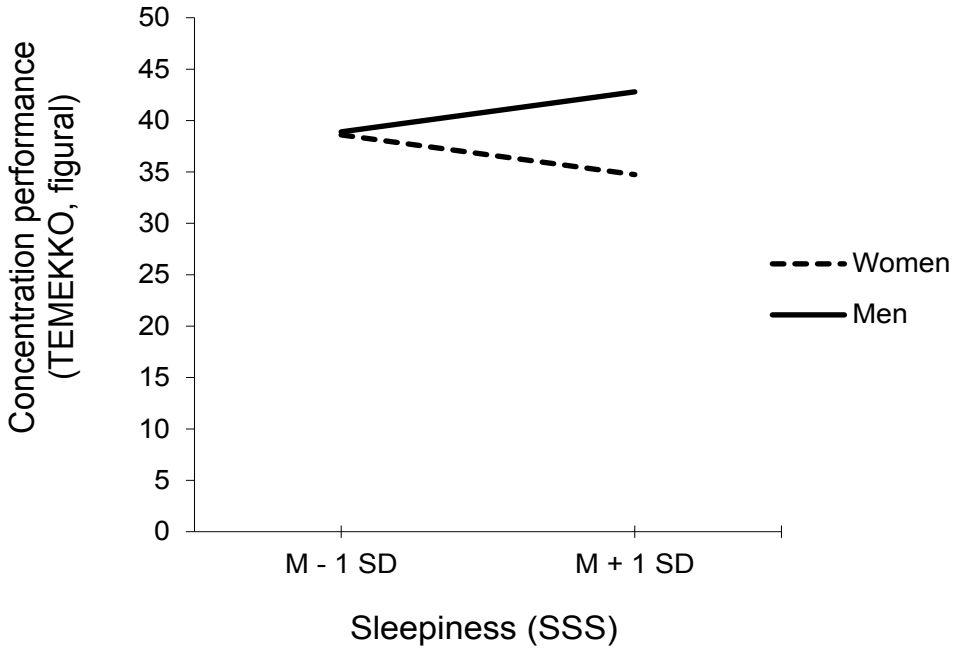

Figure 1: Estimated scores on the TEMEKKO (figural subtest) in men and women scoring one standard deviation below (M – 1 SD) and one standard deviation above (M + 1 SD) the sample mean on the Stanford Sleepiness Scale.

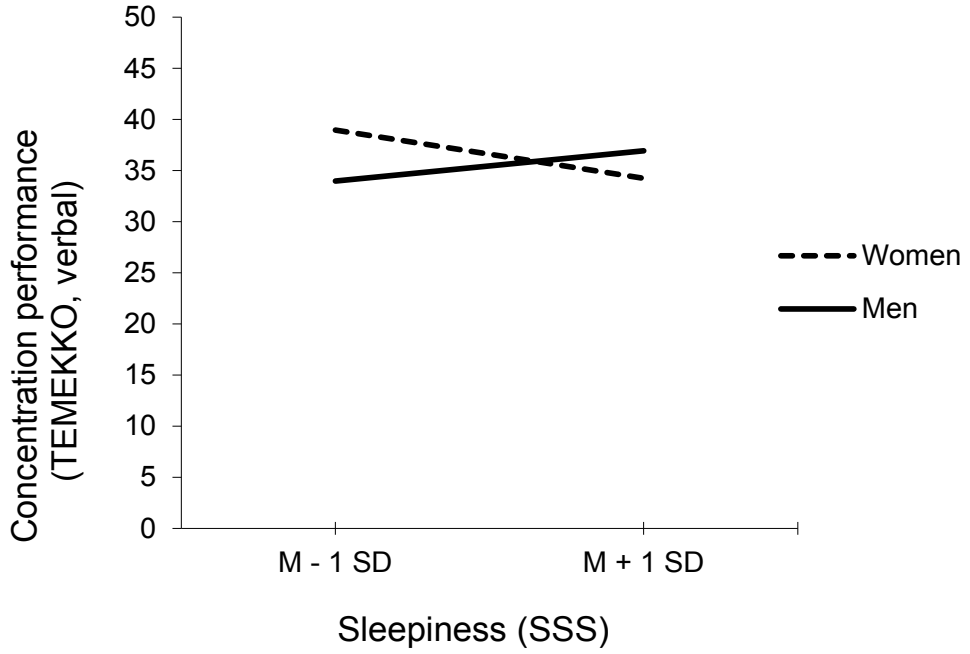

Figure 2: Estimated scores on the TEMEKKO (verbal subtest) in men and women scoring one standard deviation below (M – 1 SD) and one standard deviation above (M + 1 SD) the sample mean on the Stanford Sleepiness Scale.

= .06; numerical, F(1,97) = 4.1, p = .047, η_p^2 = .04; verbal, F(1,97) = 1.4, p = .242, η_p^2 = .01). No significant gender differences were found in the concentration performance of the d2 test (F(1,101) = .62, p = .434).

■ Burnout subtypes

Cluster analysis with the global burnout index and depression score revealed three different clusters, namely subgroup 1 with moderate burnout/ mild depression (n=34), subgroup 2 with high burnout/severe depression (n=33) and subgroup 3 with severe burnout/ moderate depression (n=36). The three clusters significantly differed from each others in their symptom severity (burnout index (F(2,100) = 55.3, p ≤ .001, η_p^2 = .53); depression score (F(2,100) = 106.2, p ≤ .001, η_p^2 = .68); but not in gender distribution (χ^2 (2, n = 103) = .61, p = .74). That is, both genders were equally distributed across the three burnout subgroups. Using 3 (subgroup) x 2 (gender) analysis of variance ((M)ANOVAs) we found virtually identical results for the main effect gender as reported above. Furthermore, we revealed significant main effects of the burnout subgroups for the mood/personality variables and sleep/alertness measures (all p ≤ .001) but not for the cognition measures. Subgroup 1 showed significantly lower scores in all mood/ personality and sleep/alertness scales (all p<.05) than the two other burnout subgroups. Subgroup 2 and 3 only significantly differed in the BDI (p< .001) and emotional exhaustion scale (p=.014). Most importantly, the interaction effect subgroup by gender was not significant for any of the variables. That means that men and women differed from each other in the same way and to the same extent in all three burnout subgroups. The means of the burnout-index and depression score for the different burnout subtypes are shown in Table 4.

Discussion

In this study men and women did not differ in their depression scores, but women showed higher levels in the emotional exhaustion scale of the MBI and reduced BBS-vitality and vigilance-scores as well as a trend towards statistically significant reduced scores in social extraversion compared to men. The small mean effect size for the MBI emotional exhaustion scale is in accordance with the results of the meta-analysis of Purvanova *et al.* [20]. A larger gender effect was found in the BBS-vitality score, which refers to mental and physical vigor. Furthermore, our data revealed higher levels of sleepiness and tiredness in women. High work demands and stress have previously been related to an increase in sleep complaints [46-49] and sleep

Table 4: Means and standard deviations of the burnout-index and depression score for the different burnout subtypes.

	Subgroup 1 moderate burnout/ mild depression		Subgroup 2 high burnout/ severe depression		Subgroup 3 severe burnout/ moderate depression	
	Men n=14	Women n=20	Men n=11	Women n=22	Men n=12	Women n=24
Burnout index	7.6 (1.1)	7.6 (1.3)	9.5 (1.4)	9.6 (1.4)	10.1 (0.8)	10.4 (0.8)
BDI	11.2 (7.1)	14.1 (5.3)	32.5 (7.4)	32.5 (5.3)	19.3 (4.3)	19.6 (4.7)

Note: M (SD); no significant gender differences

disturbances can be regularly found in burnout patients [50,51]. Most of these studies, especially in clinical burnout, were performed with a relatively small number of subjects and, therefore, gender differences were not evaluated. In healthy subjects, gender differences in sleep disturbances and insomnia are commonly reported with a higher prevalence of insomnia in women, which is also supported by evidence of sex differences in objective indicators of sleep (e.g., actigraphy and polysomnography) (for a review see [52]; for a meta-analysis see [53]). However, in a large sample of working adults, Brand *et al.* [50] did not find gender differences in sleep complaints, which might be due to an underrepresentation of more severe burnout cases in the sample.

It is well established that daytime sleepiness and chronic fatigue are associated with cognitive impairments [54] (for a review see [55]). Especially deficits in working memory and executive functions might be one of the mediating factors in the established link between burnout and reduced work performance but until now only few studies have taken into account the role of confounding factors such as actual depression and sleepiness (for an extensive discussion on the role of confounding factors please see [23]). The review by Deligkaris *et al.* [23] provide some evidence that those studies that did not control for confounding factors that could affect cognitive functions regardless of the development of burnout, such as depression and fatigue, might have overestimated the association between cognitive dysfunction and burnout. We did not find any gender differences in the concentration performance of the d2 test, but men showed better performance in a more demanding and comprehensive test (TEMEKKO) measuring concentration and executive control (in different domains). However, these gender differences varied as a function of actual sleepiness.

Finally, our study revealed gender differences in personality characteristics and work-related coping strategies, with women showing higher ratings on the DSB scales: "Other pepole's expectations" and a trend towards statistically significant higher ratings on the scale "Sense of security". Previous meta-analytic reviews showed gender differences in coping strategies such as seeking emotional support or rumination (for a review see [56,57]).

Using cluster analysis we could distinguish three different burnout subgroups. The three clusters significantly differed from each others in their symptom severity (burnout index and depression score) but not in gender distribution and might, therefore, represent patients at different stages in the burnout cycle. Most importantly, gender differences were the same in all burnout subgroups.

A limitation of the current study is that the analyses were based on cross-sectional report questionnaires and due to the rather small sample size and different interventions in the two rehabilitation clinics, we were not able to investigate if men and women responded differently to therapy. In the current paper the term clinical burnout is used to distinguish our study population of clinically diagnosed patients treated in a specialized psychosomatic clinic from non-clinical burnout groups who report symptoms of a burnout but are neither diagnosed by a psychiatrist or clinical psychologist as such and who are all still working. Although, in the current study we used similar inclusion criteria for clincial burnout as previous studies [32,34], however since there is no consistent definition of burnout the comparability and generealizability of our results may be limited. The burnout diagnosis in the present study was based on the ICD-10 criteria of work-related neurasthenia, which has been proposed as the psychiatric equivalent of clinical burnout [35]. Additionally, we included only patients who scored ≥ 2.20 on exhaustion and either ≥ 2.00 on cynicism or ≤ 3.67 on professional efficacy in the MBI-GS. Nevertheless, using solely clinical burnout patients with the ICD-10 criteria for

work-related neurasthenia as well as MBI cut-off scores to establish the diagnosis burnout may have affected the external validity of the study. Hence, the findings of our study might not generalize to clinical burnout patients who are diagnosed differently or nonclinical populations. A further limitation of the present study is that the patients were not screened for comorbid psychiatric disorders.

Taken together, our study showed gender differences in clinical burnout patients, with women showing higher scores in emotional and physical exhaustion symptoms that also affected cognitive performance. Since a definite understanding of most aspects of burnout in women is still lacking, these findings may have implications for the development of gender-specific rehabilitation programs. Directing the main focus of attention on the emotional and physical exhaustion burnout component in women and including treatment components such as graded exercise and bright light therapy, which have been proven to be especially effective for the emotional and physical exhaustion symptoms [58-61] may foster subjective well-being in women and lead to a more readily improvement and reintegration into their jobs. Having identified distinct gender differences in work-related coping strategies in the present study it is hoped that more precise and effective stress management programs and psychotherapeutic approaches that account for the unique response styles of each gender to occupational stress can be developed.

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Ethical standards

The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1964, as revised in 2008.

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