



The interplay between emotional exhaustion, common mental disorders, functioning and health care use in the working population



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ABSTRACT

Objectives: Previous research established that emotional exhaustion - the often assumed core dimension of burnout - diminishes job-related functioning, but knowledge of its association with functioning and health care utilization is largely lacking. Moreover, as exhaustion frequently co-occurs with mood and anxiety disorders (i.e. common mental disorders (CMD)), the question should be addressed whether these associations hold after adjustment for CMD, and whether CMD intensifies the burden of exhaustion.

Methods: Cross-sectional data was used from 2902 workers included in the third wave of the Netherlands Mental Health Survey and Incidence Study-2, a nationally representative face-to-face survey. Exhaustion was assessed with the exhaustion scale of the Maslach Burnout Inventory; work loss (including presenteeism and absenteeism) with the WHO Disability Assessment Schedule; and general functioning with the 36-item Short Form. Health care use is defined as ≥ 1 general or mental health care contact for mental health problems. Confounders included sociodemographics, job characteristics, CMD, and physical health. The Composite International Diagnostic Interview assessed CMD.

Results: Mild and severe exhaustion occurred in 14.9% and 2.3% of the workers, respectively, and was significantly associated with work loss, impaired emotional, physical and social functioning, and health care use, even after adjustment for confounders. Co-occurrence of CMD strengthened the association between exhaustion and work loss as well as impaired emotional and social functioning.

Conclusions: Exhaustion is uniquely associated with work loss, impaired functioning and health care use. Moreover, co-occurring CMD intensified impairments in functioning. This stresses the need for clinical attention to the exhaustion dimension of burnout.

1. Introduction

In the 1970s, the concept of burnout was introduced as a negative work-related state of mind which occurred in response to high job demands and overload [1]. Currently, the most frequently used definition stems from the Maslach Burnout Inventory (MBI) which identifies three key elements: emotional exhaustion, cynicism and professional inefficacy [1]. As emotional exhaustion has severe health consequences [2] and is often considered to be the core dimension of burnout [3], we focus on exhaustion as a proxy for burnout. A formal exhaustion rate is not available as there are no cross-national validated cut-off points of the MBI [4]; and neither burnout nor exhaustion is defined in the DSM.

Yet, exhaustion is estimated to occur in about 14% of the Dutch working population [5]. Burnout, and especially exhaustion, is associated with job-related functioning, such as job performance [1,6], and increases the risk and duration of sick leave [7,8]. It is, however, likely that exhaustion has a broader impact, affecting other life dimensions too. In order to better comprehend the extent of the impact of exhaustion, we address two issues: 1) a more complete measurement of the associated impact; this implies not only considering whether an individual with exhaustion is able to continue to work, but also whether social, emotional and physical functioning are impaired and whether health care is sought; and 2) examining this wider impact after adjustment for co-occurring mental disorders.

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Regarding the more complete measurement of the impact of exhaustion, the first aspect that we consider is work loss, including both sick leave (absenteeism) and reduced functioning while at work (presenteeism) [9]. A substantial part of work loss related to mental disorders is due to reduced functioning while at work [9,10], which emphasises the need to examine absenteeism and presenteeism simultaneously. Yet, previous studies associated exhaustion with absent days [7,8] or the occurrence of presenteeism [11,12], but not jointly. We expect that severity of exhaustion is associated with work loss, meaning that work loss will mostly consist of shorter periods in people with mild exhaustion and longer periods in those with more severe exhaustion.

Second, due to a spillover effect of work experiences to other life domains [13], exhaustion likely also affects emotional and social functioning, and possibly physical functioning. To our knowledge, such a broad impact of exhaustion has not been examined in the general working population. Studies among specific samples such as surgeons, nurses or home caregivers showed that burnout was related to reduced quality of life in general (for example [14–17]). We therefore hypothesize that exhaustion is associated with impaired emotional, social and physical functioning in the general working population as well.

Lastly, exhaustion may prompt referral to a company doctor or general practitioner, though, as far as we are aware, it is unknown to what extent general health care is sought by workers with exhaustion. In the Netherlands, there are no financial barriers to receiving general health care and company doctors even have guidelines to identify and treat exhaustion [18]. Yet, a formal DSM diagnosis - which is often leading in a mental health care setting - is lacking and this could limit mental health care use for exhaustion. It is likely that such a threshold predominantly relates to mild exhaustion and less to severe exhaustion, as more specialized care is then thought to be essential [19]. We therefore hypothesize that exhaustion is associated with both general and mental health care [20], but that people with mild exhaustion predominantly receive general health care, whereas those with severe exhaustion more frequently receive mental health care.

To determine the relationship of exhaustion with work loss, functioning and health care use, adjustment for potential confounders (i.e. sociodemographics [21], job characteristics [22], mental health [23] and physical health [24,25]) is required. The relationship between exhaustion and depression is particularly marked [23] and it has even been suggested that these two constructs represent the same phenomenon [26]. Yet, as not all individuals with exhaustion have a depressive disorder, it seems more likely that exhaustion and depression are related but not identical concepts [1,27]. A recent study confirmed this assumption and observed a subtype of burnout characterized by high levels of both depression and anxiety without fully coinciding with DSM diagnoses of mood and anxiety disorders (i.e. common mental disorders (CMD)) [28]. Assuming that exhaustion is a unique phenomenon, we hypothesize that the relationship between exhaustion and work loss, functioning and health care used is maintained after adjustment for confounders including CMD. Importantly, if this is true, the following issue arises: namely, the co-occurrence of exhaustion and CMD may point to a subgroup [28] with an especially high burden; i.e. more work loss and poorer functioning. This is supported by findings from a clinical study suggesting that the large majority of people in treatment for exhaustion also have a CMD and that this co-occurrence might result in a more severe course of exhaustion symptoms [29]. Therefore, we hypothesize that the co-occurrence of exhaustion and CMD results in a higher burden than what would be expected from the sum of their separate burdens.

Using cross-sectional data from the third wave (T_2) of the Netherlands Mental Health Survey and Incidence Study-2 (NEMESIS-2), a representative psychiatric epidemiological study, we address the following hypotheses: 1) exhaustion is associated with work loss, impaired emotional, physical and social functioning, and the use of general and mental health care, 2) these associations are maintained after

adjustment for confounders including CMD; and 3) the co-occurrence of exhaustion and CMD results in a higher burden than what would be expected from the sum of their separate burdens.

2. Methods

NEMESIS-2 is based on a multistage, stratified random sampling of households, with one respondent randomly selected in each household. Face-to-face interviews were conducted at the respondent's home. A comprehensive description of the design is provided [30]. Exhaustion was assessed at T_2 and therefore data from this wave were used for the present study, resulting in a cross-sectional design.

In the first wave (T_0), performed from November 2007 to July 2009, 6646 persons were interviewed (response = 65.1%). This sample was nationally representative, although younger subjects were somewhat underrepresented [30]. All T_0 respondents were approached for follow-up (T_1) three years after T_0 (November 2010–June 2012) and 5303 persons were interviewed again (response = 80.4%). All T_1 respondents were approached for a second follow-up (T_2) three years after T_1 (November 2013–June 2015) and 4618 persons were interviewed again (response = 87.8%). Attrition between T_0 and T_2 was not significantly associated with all individual 12-month mental disorders at T_0 after controlling for sociodemographics, except for bipolar disorder [31].

For the present study, this sample was limited to the working population, i.e. subjects younger than 65 (the official age of retirement during the study period) working ≥ 12 h a week ($n = 2902$).

2.1. Emotional exhaustion

The emotional exhaustion scale of the Utrecht Burnout Scale (the Dutch version of the MBI – General Survey [32,33]) was used. Exhaustion was calculated as the mean score of five items (Cronbach's $\alpha = 0.85$), with scores ranging from never (0) to daily (6). As in [27], three severity categories were created: no (0–1.49), mild (1.50–3.49) and severe exhaustion (3.50–6).

2.2. Work loss

Work loss consisted of both sick leave and reduced functioning while at work [9]. Specifically, a count of work loss days was based on three questions of the WHO Disability Assessment Schedule [34] assessed at T_2 : How many days out of the past 30 days: 1) were you totally unable to work or carry out your normal activities (absenteeism)?; 2) were you able to work and carry out your normal activities, but had to cut down on what you did, or did not get as much done as usual (presenteeism)?; 3) did you cut back on the quality of your work or how carefully you worked (presenteeism)? Number of work loss days is the sum of the days of these three types of loss, where 1 day of reduced functioning (i.e. presenteeism) was counted as half, as in [9,10]. Because this variable was not normally distributed, three categories were created: no (0 days), short (0.5–7 days), and extended work loss (> 7 days) in the past month [35].

2.3. Functioning

Functioning in the past 4 weeks was assessed at T_2 with three subscales of the Medical Outcomes Study Short Form Health Survey [36,37]. Emotional functioning involves general role limitations due to personal or emotional problems (3-item, 2-point scale; Cronbach's $\alpha = 0.85$). Physical functioning involves general role limitations due to physical problems (4-item, 2-point scale; $\alpha = 0.88$). Social functioning involves problems in one's normal social activities due to emotional or physical problems (2-item, 6-point scale; $\alpha = 0.77$). The scores of these scales were transformed so that all scales varied from 0 to 100, and were then dichotomized into no impairment

(100 = 0) and impaired functioning (0–99 = 1), because of their skewed distribution [35].

2.4. Health care use

Health care use comprises ≥ 1 contact in the general or mental health care sector for emotional or addiction problems, assessed with the question: ‘In the past 12 months, did you visit any of the following professionals or institutions because of emotional or alcohol or drugs problems of your own?’. Included general health care providers were: general practitioners, company doctors, social workers, home care or district nurses, physiotherapists or haptonomists, medical specialists, and nurse practitioners. Included mental health care providers were: psychiatrists, psychologists, psychotherapists, and part-time or full-time psychiatric treatment. Three mutually exclusive groups were created: no health care; *only* general health care; mental health care (with or without general health care).

2.5. Confounders

Previous research suggests the inclusion of the following confounders: sociodemographic [21] and job characteristics [22], CMD [23], and physical health [24,25]. All confounders were measured at T_2 except educational level, which was measured at T_0 .

2.5.1. Sociodemographic characteristics

Gender, age, educational level, partner status, having children living at home and not having enough income to live on were considered.

2.5.2. Job characteristics

As objective job characteristics, being self-employed, working > 36 h per week and having an executive position were included. Additionally, three subjective job characteristics were included: future job insecurity, being bullied, and having experienced aggression at work in the past 12 months.

2.5.3. Common mental disorders

DSM-IV diagnoses were made using the Composite International Diagnostic Interview (CIDI) 3.0, a fully structured lay-administered diagnostic interview [38]. The disorders considered here include 12-month mood (major depression; dysthymia; bipolar disorder) and anxiety disorders (panic disorder; agoraphobia without panic disorder; social phobia; generalized anxiety disorder). Though the CIDI 3.0 has not been validated in the Netherlands, clinical calibration studies in various other countries [39] found that the CIDI 3.0 assesses these disorders with generally good validity in comparison to blinded clinical reappraisal interviews.

2.5.4. Physical health characteristics

The physical health characteristics were: smoking (in the past month), high alcohol consumption (on average > 14/21 drinks weekly for women/men in the past 12 months), being physically inactive (engaging < 1 h per week in physical exercise/sport), obesity (Body Mass Index of > 30), and any chronic physical disorder (presence of ≥ 1 of 17 chronic physical disorders treated or monitored by a medical doctor in the past 12 months, assessed with a standard checklist). Comparisons between self-reports of chronic physical disorders and medical records show moderate to good concordance [40].

2.6. Analyses

Analyses were performed using Stata version 12.1, which enables controlling for the complex sampling and recruitment procedure of the study. The data were weighted to ensure they were representative of the national working population.

First, characteristics across all three exhaustion categories (no, mild or severe exhaustion) were calculated using descriptive analyses. Second, (multinomial) logistic regression analyses were performed to examine the association between exhaustion and work loss, functioning and health care use. These models were run without (model 1) and with adjustment for sociodemographic, job and physical health characteristics (model 2) and additionally for CMD (model 3). In multinomial regression analyses, according to Stata, relative risk ratios (RRRs) should be interpreted as the risk of the particular group relative to the base group [41], and they are thus very similar to odds ratios (ORs). Third, it was investigated whether the combined effect of exhaustion and CMD on work loss and functioning is stronger than the sum of the separate effects. To test this additive interaction, two dichotomous variables were created: any exhaustion (mild or severe) and any CMD (12-month mood or anxiety disorder). Additive interaction is present when the lower boundary of the 95% confidence interval of the OR of exhaustion and CMD combined is greater than the expected value in case of no interaction, namely $OR(A) + OR(B) - 1$ [42]. Finally, as sensitivity analyses, model 3 of the (multinomial) logistic regression analyses and the additive interaction analyses were conducted using 1-month instead of 12-month CMD.

3. Results

3.1. Correlates of exhaustion

Mild and severe exhaustion occurred in 14.9% and 2.3% of the workers, respectively. Mild exhaustion occurred more often in respondents aged 24–34, whereas severe exhaustion occurred more often in respondents aged 55–64 (Table 1). Living without children, future job insecurity, being bullied, and 12-month mood and anxiety disorder were gradually associated with exhaustion; these correlates were more often present in those with mild exhaustion (compared to those without exhaustion) and even more in those with severe exhaustion. Additionally, not having enough income to live on, high alcohol consumption, physical inactivity, obesity and a chronic physical disorder occurred more frequently in workers with severe exhaustion.

3.2. Association between exhaustion and work loss

33.2% of the respondents with mild exhaustion reported short and 16.9% extended work loss (Table 1). Compared to those without exhaustion, those with mild exhaustion were 2.1 and 3.2 times more likely to report short and extended work loss, respectively (Table 2: model 1). After adjustment for the first set of confounders (model 2), these associations remained highly significant, with similar relative risk ratios (RRRs). This was also the case after additional adjustment for CMD (model 3).

Of respondents with severe exhaustion, 15.7% reported short and 51.2% extended work loss. Compared to those without exhaustion, respondents with severe exhaustion were not more likely to report short work loss, but were 14.7 times more likely to report extended work loss. In model 2, the association with extended work loss remained highly significant (RRR = 10.6). In the fully adjusted model, the RRR was lower but remained significant.

3.3. Association between exhaustion and functioning

24.9% of the respondents with mild exhaustion reported impaired emotional functioning, 31.2% reported impaired physical functioning and 54.8% impaired social functioning (Table 1). Compared to those without exhaustion, respondents with mild exhaustion were 4.9, 2.2 and 3.3 times respectively more likely to report these three types of impaired functioning (Table 2: model 1). After adjustment for the first set of confounders, these associations remained highly significant, with similar ORs (model 2) and this was also the case after additional

Table 1

Work loss, impaired functioning, health care use and potential confounders across exhaustion categories in the working population (N = 2902), in weighted column percentages and the p-values of the chi².

	Total		Exhaustion			p value
			No	Mild	Severe	
	N	%	%	%	%	
	2902 (100)		2408 (82.8)	424 (14.9)	70 (2.3)	
Work loss						
No work loss	1971	66.2	70.1	49.9	33.1	
Short work loss	655	24.0	22.5	33.2	15.7	
Extended work loss	276	9.8	7.4	16.9	51.2	< 0.0001
Impaired functioning						
Emotional	282	10.0	6.4	24.9	44.0	< 0.0001
Physical	581	19.9	16.9	31.2	55.2	< 0.0001
Social	927	32.0	26.7	54.8	75.2	< 0.0001
Health care use						
No health care	2592	89.6	92.3	79.4	58.1	
Only general health care	126	4.0	3.0	9.4	7.1	
Mental health care	184	6.4	4.8	11.2	34.9	< 0.0001
Potential confounders						
Sociodemographic characteristics						
Female	1466	44.3	44.3	43.2	50.1	0.73
Age at interview						
24–34	454	23.4	21.9	33.0	17.3	
35–44	791	27.2	27.7	25.5	18.9	
45–54	1013	30.5	31.7	22.9	35.5	
55–64	644	18.9	18.7	18.6	28.2	0.005
Education						
Lower secondary	618	23.0	23.0	21.1	38.0	
Higher secondary	1009	42.9	43.4	40.4	38.1	
Higher professional, university	1275	34.1	33.6	38.5	23.9	0.14
Living without partner	726	26.6	25.8	29.9	36.3	0.19
Living with children at home	1627	53.4	54.7	48.2	39.6	0.008
Not enough income to live on	127	4.2	3.9	4.2	17.1	0.0005
Job characteristics						
Self employed	493	17.3	18.0	14.3	9.8	0.15
> 36 working hours	1162	43.9	44.0	45.3	32.0	0.25
Executive position	842	28.7	29.5	25.5	19.4	0.15
Future job insecurity	139	5.0	3.5	10.0	25.6	< 0.0001
Being bullied at work	109	4.0	3.3	6.8	8.2	0.01
Felt aggression at work	391	13.7	12.9	16.8	23.8	0.10
12-Month common mental disorder						
Mood disorder	122	4.1	2.6	8.1	33.0	< 0.0001
Anxiety disorder	95	3.7	2.5	7.0	28.2	< 0.0001
Physical health						
Current smoking	686	26.3	25.9	26.6	41.4	0.20
High alcohol consumption	123	4.3	4.4	2.8	10.5	0.02
Physical inactive	945	33.0	32.1	34.4	58.1	0.005
Obesity	333	11.6	11.2	10.9	32.4	0.001
Any chronic physical disorder	985	32.4	31.1	35.2	60.9	0.0003

Exhaustion: no: 0–1.49; mild: 1.50–3.49; severe: 3.50–6.
 Bold: Significant at the 0.05 level, 2-sided test.

adjustment for CMD (model 3).

Of respondents with severe exhaustion, 44.0% reported impaired emotional functioning, 55.2% impaired physical functioning and 75.2% impaired social functioning. Compared to those without exhaustion, respondents with severe exhaustion were 11.5, 6.1 and 8.3 times respectively more likely to report these types of impaired functioning. After adjustment for the first set of confounders, these associations remained significant but the ORs decreased to 9.3, 3.7 and 6.3. In the fully adjusted models, the ORs decreased further but remained significant.

3.4. Association between exhaustion and health care use

Of respondents with mild exhaustion, 9.4% used *only* general health care and 11.2% used mental health care with or without general health care (Table 1). Compared to those without exhaustion, respondents with mild exhaustion were 3.7 and 2.7 times respectively more likely

use health care (Table 2: model 1). In model 2, these associations remained highly significant, with similar RRRs, and this was also the case in model 3.

Of respondents with severe exhaustion, 7.1% used *only* general health care and 34.9% used mental health care with or without general health care. Compared to those without exhaustion, respondents with severe exhaustion were 3.8 and 11.6 times respectively more likely to use health care. In model 2, these associations remained significant, with similar RRRs. In model 3, the association with *only* general health care was no longer significant, but severe exhaustion was still significantly associated with mental health care use (RRR = 4.2).

3.5. Combined burden of exhaustion and common mental disorders

Thus far, the results showed that the associations between exhaustion and work loss, functioning and health care use remained significant after adjustment for 12-month CMD. This confirms our hypothesis that

Table 2

Exhaustion as a correlate of work loss, functioning and health care use in the working population (N = 2902), in weighted relative risk ratios (RRR; multinomial logistic regression analyses) or odds ratios (OR; logistic regression analyses).

	Work loss		Impaired functioning			Health care use	
	Short	Extended	Emotional	Physical	Social	Only GHC	MHC
	RRR (95% CI)	RRR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	RRR (95% CI)	RRR (95% CI)
Model 1							
Exhaustion							
No	1	1	1	1	1	1	1
Mild	2.07*** (1.49,2.88)	3.23*** (2.10,4.97)	4.87*** (3.43,6.92)	2.22*** (1.61,3.07)	3.32*** (2.56,4.31)	3.69*** (2.23,6.09)	2.72*** (1.81,4.09)
Severe	1.47 (0.61,3.53)	14.72*** (6.33,34.21)	11.51*** (4.88,27.15)	6.06*** (2.92,12.59)	8.31*** (2.95,23.36)	3.78** (1.47,9.74)	11.59*** (5.35,25.09)
Model 2							
Exhaustion							
No	1	1	1	1	1	1	1
Mild	1.99*** (1.42,2.78)	2.96*** (1.90,4.61)	4.47*** (3.11,6.43)	2.13*** (1.46,3.09)	3.21*** (2.41,4.26)	3.61*** (2.12,6.13)	2.69*** (1.80,4.02)
Severe	1.46 (0.56,3.82)	10.60*** (4.38,25.61)	9.26*** (3.80,22.59)	3.68** (1.53,8.84)	6.29* (2.11,18.75)	3.25* (1.08,9.75)	11.31*** (5.21,24.53)
Model 3							
Exhaustion							
No	1	1	1	1	1	1	1
Mild	1.95*** (1.39,2.74)	2.73*** (1.75,4.26)	4.06*** (2.81,5.86)	2.04*** (1.38,3.02)	3.03*** (2.28,4.03)	3.23*** (1.83,5.71)	2.21*** (1.40,3.50)
Severe	1.22 (0.47,3.14)	6.94*** (2.85,16.88)	5.19** (2.19,12.28)	2.87* (1.19,6.95)	4.25* (1.40,12.91)	1.49 (0.50,4.44)	4.19** (1.59,11.06)

Short work loss: 0.5–7 work loss days in the past month; extended work loss: > 7 work loss days in the past month. GHC: *only* general health care; MHC: mental health care.

Exhaustion: no: 0–1.49; mild: 1.50–3.49; severe: 3.50–6.

Model 1: unadjusted.

Model 2: adjusted for sociodemographic characteristics (gender, age, education, living without partner, living with children at home, not enough household income to live on), job characteristics (self-employed, > 36 working hours, executive position, future job insecurity, being bullied, felt aggression) and physical health characteristics (current smoking, high average alcohol consumption, being physical inactive, obesity, any chronic physical disorder).

Model 3: adjusted for characteristics of model 2 as well as for common mental disorders (12-month mood and anxiety disorders).

* p < 0.05.

** p < 0.01.

*** p < 0.001.

exhaustion is not the same as a CMD. Moreover, as two separate constructs, exhaustion and co-occurring CMD could strengthen each other's effect. This was examined via additive interaction which revealed that the co-occurrence of any exhaustion (mild or severe) and any CMD (12-month mood or anxiety disorder) is significantly associated with an additional high risk of extended work loss (combined RRR = 13.1 (95% CI = 6.7–25.8); sum of separate RRRs = 3.9), impaired emotional functioning (combined OR = 24.4 (95% CI = 10.4–57.6); sum of separate ORs = 8.5) and impaired social functioning (combined OR = 12.5 (95% CI = 6.0–26.0); sum of separate ORs = 5.5). No additive interaction was observed for short work loss and impaired physical functioning.

3.6. Sensitivity analyses

Sensitivity analyses, which focused on 1-month instead of 12-month CMD, revealed similar findings. That is, associations between exhaustion and work loss, functioning and health care use also remained significant after adjustment for 1-month CMD (Table available on request). Similarly, an additive interaction effect was revealed for the co-occurrence of any exhaustion and any 1-month CMD on impaired emotional functioning (combined OR = 69.4 (95% CI = 25.3–189.8); sum of separate ORs = 14.6) and impaired social functioning (combined OR = 29.2 (95% CI = 10.5–81.4); sum of separate ORs = 8.0). No additive interaction was observed for short and extended work loss and impaired physical functioning.

4. Discussion

4.1. Key findings

To our knowledge, this is the first study to examine such a broad impact of exhaustion, including work loss (both absenteeism and presenteeism), impaired functioning and health care use, while adjusting

for 12-month CMD. Mild exhaustion was associated with short and extended work loss, impaired emotional, physical and social functioning, and use of general and mental health care. Severe exhaustion was not associated with short work loss, but strongly associated with extended work loss, the three areas of functioning and health care use. Almost all these associations remained significant after adjustment for 12-month CMD. Co-occurrence of exhaustion and CMD resulted in an additional high risk of extended work loss and impaired emotional and social functioning.

4.2. Strengths and limitations

This study had the advantage of a large working population sample and included adjustment for 12-month CMD in investigating the relationships. However, some cautionary remarks should be made.

First, only the emotional exhaustion dimension of burnout was included in the study, as previous research had observed that exhaustion represents the core burnout dimension [3,24]. The current findings thus cannot be generalized to other burnout dimensions. Second, exhaustion was divided into three severity categories to enable comparison with other research (e.g. [7]). However, for the Netherlands, another, clinically validated, cut-off point is available (i.e. 2.2 [33]). As this lies in between the cut-off points of mild and severe exhaustion (1.5 and 3.5), the associated burden will likely be somewhere between these. Third, as the MBI measures the current state of exhaustion, associations with measures that reflect a longer time period (e.g. 12-month CMD, 12-month health care use) are difficult to interpret as these may have preceded the exhaustion. Regarding CMD, sensitivity analyses with 1-month instead of 12-month CMD were performed. Similar results were observed, suggesting that the reported findings are robust. Fourth, our findings were based on cross-sectional analyses, thus one should be careful in interpreting these findings as no causal relationships were examined.

4.3. Findings

Mild and severe exhaustion occurred in 14.9% and 2.3%, respectively, of the working population. The total exhaustion rate was 17.2% - quite similar to the previously observed 14% in the Netherlands [5]. As expected, mild and especially severe exhaustion were strongly related to 12-month CMD. As in previous population-based research [27], one third of those with severe exhaustion also reported a 12-month mood disorder. 12-Month anxiety disorder occurred in 28% of those with severe exhaustion. This supports the notion that exhaustion is strongly associated with CMD, but that the constructs do not fully coincide. Of the other included confounders, physical health - especially having a chronic physical disorder - stands out as having strong associations with exhaustion. This confirms findings of previous population-based research [24,25] and it corroborates our decision to adjust for these confounders when examining the impact of emotional exhaustion.

One third of individuals with mild exhaustion reported short and 17% extended work loss. People with severe exhaustion more often reported extended work loss (51%) than short work loss (16%). This confirms our hypothesis that work loss in those with mild exhaustion mostly consists of short periods and in those with severe exhaustion mostly of longer periods. In line with our expectations, the associations remained after adjustment for confounders including 12-month CMD. It therefore seems essential not only for general practitioners and psychologists, but also for employers to pay attention to the prevention of exhaustion.

Besides work loss, it was examined whether exhaustion was associated with impairment in emotional, physical or social functioning. As hypothesized, both mild and severe exhaustion were strongly associated with impaired emotional, physical and social functioning, also in fully adjusted models. This supports the notion that the impact of exhaustion is broad for both employees and their close network. These findings confirm earlier research showing that burnout was related to reduced quality of life in health care nurses [14,17]. Notably, compared to those with mild exhaustion, those with severe exhaustion reported higher rates of impaired emotional, physical or social functioning as well as extended work loss. It is likely that in those individuals, the impairments in functioning affect their ability to stay at work and will subsequently result in (extended) work loss. However, as the current study was cross-sectional, we could not examine such a longitudinal relationship and this should be addressed in future research.

Although we expected that people with mild exhaustion would predominantly receive general health care *only*, we observed that both general and mental health care were equally used in this group. However, as hypothesized, among those with severe exhaustion, care is usually not limited to general health care: more than one third received mental health care whereas 7% received general health care *only*. As mentioned, due to the 12-month time-frame of health care use in the present study, causality is not clear: it is likely that current exhaustion preceded health care use, but the care may also have preceded the current exhaustion. Still, three out of five people with severe exhaustion did not contact a health care professional in the past year, despite the major impact of exhaustion on several areas of functioning. For some, a recent onset of burnout could be the cause, and perhaps treatment contact was not yet made. Another reason could be that in the Netherlands only company doctors have guidelines to classify exhaustion [18]. That is, a clinical classification of exhaustion is lacking [4] and as neither burnout nor exhaustion is included in the DSM, guidance to mental health care and identification of the syndrome could be hindered. The importance of a clinical classification for recognition of the syndrome is demonstrated by the fact that exhaustion disorder became one of the five most common disorders in Sweden soon after its introduction in the Swedish ICD-10 [18]. Development of a clinical classification therefore appears to be a priority so that recognition and guidance to treatment can be further improved.

The present study examined the relationship between exhaustion

and work loss, impaired functioning and health care use, while adjusting for 12-month CMD. All observed relationships were maintained in the fully adjusted models and this was also the case in the sensitivity analyses adjusting for 1-month CMD. This shows that exhaustion is independently associated with a significant burden. Lastly, we examined whether the two constructs of exhaustion and 12-month CMD strengthen each other's effect, resulting in a subgroup of exhaustion with an especially high impact. This appeared true for extended work loss and for impaired emotional and social functioning. People with both exhaustion and 12-month CMD had a higher rate of each of these aspects than what would be expected from the sum of the separate effects. As the co-occurrence with CMD was particularly marked in people with severe exhaustion, it seems desirable that adequate treatment for them is developed so that their exceptionally high burden can be appropriately addressed.

In sum, the emotional exhaustion dimension of burnout has a broad impact with strong associations with work loss, impaired functioning and health care use. Enhanced clinical attention to exhaustion is desirable, for example by developing a clear definition, by implementing effective prevention programmes in the work place and by appropriately addressing exhaustion in treatment settings. Specifically, due to a current focus on DSM-defined diagnoses in mental health care, a large group with emotional exhaustion can easily be overlooked whereas appropriate treatment seems desirable.

COI statement

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