Fatigue, burnout, and chronic fatigue syndrome among employees on sick leave: do attributions make the difference?

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Background: Persistent fatigue among employees, burnout, and chronic fatigue syndrome (CFS) are three fatigue conditions that share some characteristics in theory. However, these conditions have not been compared in empirical research, despite conceptual similarities.
Methods: This cross sectional study aimed to investigate relations between persistent fatigue, burnout, and CFS by describing the clinical features of a sample of 151 fatigued employees on sick leave. Using validated instruments, subgroups based on research criteria for CFS and burnout within the sample of fatigued employees and a reference group of 97 diagnosed CFS patients were compared. Analyses of covariance were performed.
Results: A total of 66 (43.7%) fatigued employees met research criteria for CFS (except symptom criteria) and 76 (50.3%) met research criteria for burnout. "CFS-like employees" (fatigued employees who met CFS criteria) reported stronger somatic attributions than "non-CFS-like employees". Burnt out CFS-like employees were more depressed and distressed than CFS-like employees who were not burnt out. Burnout cases among the non-CFS-like employees had stronger psychological attributions than fatigued employees who were not burnt out. Compared to diagnosed CFS patients, CFS-like employees merely had a shorter duration of fatigue complaints. Burnt out CFS-like employees had stronger psychological attributions and were more distressed than CFS patients.
Conclusions: Fatigued employees shared many important characteristics with CFS patients, regardless of burnout status, and many fatigued employees met CFS criteria and/or burnout criteria. Differences however concerned the causal attributions that were made. This raises questions about the role of causal attributions: are they modified by fatigue complaints or do they determine illness outcome?

Fatigue is a common complaint in the general and working population, with a reported prevalence varying from 7% to 45%.[1–3] Fatigue can best be understood as a continuum, ranging from mild complaints frequently seen in the community on the one hand to severe, disabling fatigue, such as chronic fatigue syndrome on the other.[1] When fatigue among employees becomes severe and persistent, it may lead to long term sick leave and work disability.[4] Conceptually linked with fatigue and absenteeism is the phenomenon of burnout. In general, burnout can be described as a persistent, negative, work related state of mind characterised by work related emotional exhaustion and accompanied by distress, (perceived) reduced effectiveness, decreased motivation, and dysfunctional attitudes and behaviours at work.[5] Burnout symptoms are mostly psychological and burnt out workers often causally attribute their complaints to problems at work, blaming their jobs for their condition.[5] A conservative estimate of the prevalence of "clinical" burnout is 4.2% in the working population.[6] Like persistent fatigue, burnout can lead to long term sick leave. However, it is important to realise that persistently fatigued workers are not burnt out by definition, and that burnt out workers might not experience fatigue as a major complaint.

Both persistent fatigue and burnout are reported to be serious conditions,[6] but little research is available on their clinical features. In that respect, chronic fatigue syndrome (CFS) has received a wider range of attention.[7] CFS is characterised by persistent medically unexplained fatigue for at least six months, several unexplained symptoms, and severe functional impairment,[8] with a reported prevalence ranging from 0.2% to 0.5%.[9 10] The cause of CFS is unknown and most patients do not recover spontaneously.[11–15] Of the various somatic and psychological treatments, only cognitive behaviour therapy and graded exercise seem to be promising.[16] Interesting in that respect is that CFS patients tend to make causal attributions by assuming their illness results from a physical process.[17 18]

Main messages

- Persistent fatigue among employees, burnout, and chronic fatigue syndrome (CFS) are three fatigue conditions which share some characteristics in theory.
- Fatigued employees in this study shared many important characteristics with CFS patients, regardless of burnout status, and many fatigued employees met research criteria for CFS and/or burnout.
- Differences in causal attributions among fatigued employees and CFS patients in this study raise questions about the role of attributions in the course and duration of fatigue complaints.
- Fatigued employees might have a better prognosis than CFS patients because of a different labelling of fatigue complaints.

Policy implications

- If causal attributions influence the course and outcome of fatigue, early prevention of chronic fatigue might lie partly in modifying the labelling of complaints.

Abbreviations: ANCOVA, analysis of covariance; BDI, Beck Depression Inventory; CAL, Causal Attributions List; CFS, chronic fatigue syndrome; CIS, Checklist Individual Strength; MBI-GS, Maslach Burnout Inventory–General Survey; OHS, occupational health service; SCL-90, Symptom Checklist 90; SF-36, Short Form Health Survey

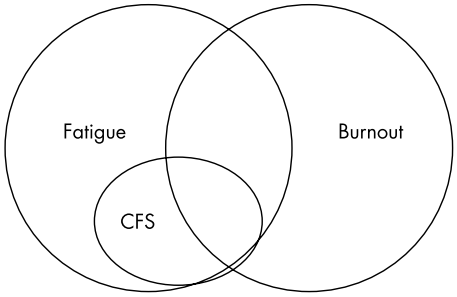

Figure 1 Proposed relations between persistent fatigue among employees, burnout, and CFS.

Several studies have shown that stronger physical causal attributions predict a longer duration of fatigue complaints in CFS.[13 15 19] It has been hypothesised that, as fatigue complaints persist in time and no medical answers can be given, the need for a single, conclusive physical causal explanation strengthens in CFS patients.[19] Whether this applies to fatigued or burnt out employees as well has yet to be investigated.

To our knowledge, there is no literature available in which CFS, burnout, and persistent fatigue among employees are compared, despite their similarities (for example, fatigue and impairment, potentially leading to work disability). A first assumption is that there is some (conceptual) overlap between these fatigue conditions, as illustrated in fig 1. Furthermore, as the duration of fatigue complaints in CFS patients increases, the chances of recovery diminish, until after 15 months complete recovery is rare.[19] This leads us to hypothesise that fatigued employees with a long duration of complaints might already fulfil criteria for CFS. Also, since causal attributions seem to play an important role in CFS, we might hypothesise that differences between the three fatigue conditions are reflected in the causal attributions that are made.

In this study, we aim to investigate relations between persistent fatigue, burnout, and CFS by describing the clinical features of a sample of fatigued employees on sick leave. Subgroups based on research criteria for CFS and burnout within the sample of fatigued employees will be compared. In addition, comparisons will be made between subgroups of fatigued employees and a sample of diagnosed CFS patients that serve as a reference group.

METHODS

Subjects

Fatigued employees on sick leave were recruited among 80 000 employees under the registration of a major occupational health service (OHS) in the south of the Netherlands. On a monthly basis, persons on sick leave for more than two weeks, irrespective of the reason, were sent a screening list. Employees were eligible for participation if they met the following inclusion criteria: severe fatigue (a score of 35 or higher on the subscale fatigue severity of the Checklist Individual Strength (CIS)[20 21]) for more than four months; fatigue reported to be one of the major health complaints; and complete absenteeism from work for 6–26 weeks. Relevant exclusion criteria were a somatic explanation for fatigue and a history of or current psychiatric co-morbidity. In total 151 fatigued employees were thus included.

In addition, 97 patients diagnosed with CFS who were on sick leave, either temporary or due to work disability, served as a reference group. These patients were part of a larger sample of diagnosed CFS patients described elsewhere.[22]

Instruments

Fatigue

Fatigue severity was measured with the subscale fatigue severity of the CIS.[20 21] This subscale contains eight items rated on a seven point scale, with scores ranging from 8 to 56, higher scores indicating a higher severity of fatigue.

Functional impairment

Functional impairment was measured with the subscale physical functioning of the Short Form Health Survey (SF-36).[23] Scores on the SF-36 can range from 0 to 100, higher scores indicating higher levels of physical functioning. For specificity reasons, we chose a rather conservative cut off point of 60 or lower for functional impairment, although others have suggested higher values (less impairment) as cut off point.[24]

Burnout

Burnout was measured with the Maslach Burnout Inventory General Survey (MBI-GS).[25 26] Scores on the three subscales of the MBI-GS (exhaustion, professional efficacy, and cynicism) can range from 0 to 6. Higher scores on these subscales indicate respectively higher levels of emotional exhaustion, (perceived) professional efficacy, and cynicism towards work in general.

Physical activity

Physical activity was measured with the actometer, a motion sensing device attached to the ankle and worn for 12 days continuously.[27] Scores reflect the average physical activity over 12 days, expressed in the average number of accelerations per five minute period. Higher scores indicate higher levels of physical activity, with a mean of 91 (SD 25) for healthy subjects.[27]

Psychological problems

Psychological problems were assessed by two related constructs, depression and psychological distress in general. Depression was measured with the Beck Depression Inventory (BDI).[28] Scores on the BDI can range from 0 to 63, higher scores indicating higher levels of depression with a score of 16 as cut off point for clinical depression. Psychological distress was measured with the Symptom Checklist 90 (SCL-90).[29] Scores on the SCL-90 can range from 90 to 450, higher scores indicating higher levels of psychological distress.

Self efficacy and attributions

To measure self efficacy, the self efficacy scale[22 30] administered in our previous CFS studies was used. The scale consists of four questions on a five point scale and one question on a four point scale that measure sense of control in relation to complaints, with scores ranging from 5 to 24, high scores indicating high levels of self efficacy. To measure beliefs regarding the somatic and psychological causes of fatigue complaints, a modified version of the Causal Attributions List (CAL)[22 30] administered in our previous CFS studies was used. The CAL consists of two subscales, psychological attributions and somatic attributions. In this study, the subscale psychological attributions contained five questions on a four point scale, with scores ranging from 5 to 20. The subscale somatic attributions contained four questions on a four point scale, with scores ranging from 4 to 16. Higher scores on these two subscales indicate stronger psychological or somatic attributions. Sample items of the self efficacy scale and the CAL are presented in the box.

Formation of subgroups

Fatigued employees were identified as potential CFS cases if they met all of the following operational research criteria: a CIS score of 40 or higher, duration of fatigue complaints six months or more, and a SF-36 score on physical functioning of 60 or lower. These operational research criteria were based on the CDC criteria[8] although CDC symptom criteria were not

Sample items of the self efficacy scale and the CAL

Self efficacy
"Whatever I do, I cannot change my complaints"
1 = yes, I am convinced of that; 4 = no, I am convinced that is not the case

Psychological attributions
"Do you think your complaints are related to stress?"
1= no, I am convinced that is not the case; 4 = yes, I am convinced of that

Somatic attributions
"Do you think your complaints are caused by something physical?"
1 = no, I am convinced that is not the case; 4 = yes, I am convinced of that

applied. A somatic explanation for fatigue and current psychiatric co-morbidity, contraindications for the diagnosis of CFS, already served as exclusion criteria for the selection of fatigued employees.

It is emphasised here that those participants who met CFS criteria did not necessarily qualify as CFS patients: a final diagnosis of CFS can only be made by a physician after an adequate physical examination. None of the fatigued employees had a CFS diagnosis at entry in the study. Therefore, those who met research criteria will be referred to as CFS-like employees (the suffix "like" was used to clarify that participants met criteria by self report only[31]).

Fatigued employees were identified as potential burnout cases if they met operational research criteria for burnout based on the Maslach Burnout Inventory–General Survey (MBI-GS). The MBI-GS contains three subscales that cover relevant aspects of burnout: exhaustion (ex), professional efficacy (pe), and cynicism (cy).[26] A clinically derived cut off point for burnout—determined from data from the Maastricht Cohort Study—was used, based on the following criteria: ex > 2.78 and pe < 3.55 or cy > 1.75 indicating potential burnout caseness.[32]

Statistical analysis

To test differences between groups, a series of analysis of covariance (ANCOVA) was performed. ANCOVA was used as a statistical matching procedure to adjust group means to what they would be if all subjects scored equally on the covariates of choice.[33] Since it is essential to select a small number of covariates to prevent reduction of power, a limited number of demographic variables were considered as potential covariates. Thus, "age" and "sex" were included as covariates in the analysis. The assumptions of the ANCOVA model (normality of sampling distributions, homogeneity of variance, reliability of covariates, absence of multicollinearity between covariates, linearity, absence of outliers, homogeneity of regression) were evaluated before each analysis. If Levene's test for equality of error variances was significant, the alpha was adjusted to 0.01. After evaluation of the main effect, pairwise comparisons between adjusted means were performed. Because of the large number of comparisons, the alpha was adjusted using the Bonferonni method.

Absence of statistically significant differences does not imply clinical comparability or equivalence. Therefore, equivalence of means was assessed by evaluation of the confidence interval (CI) for the true difference between adjusted group means.[34] First, for every measure a clinically relevant difference (Δ) was determined based on clinical reasoning of experts.[34] A range of equivalence was then predefined by setting up an interval that corresponds to a difference of no clinical importance, ranging from −Δ to +Δ. Clinically relevant differences and ranges of equivalence were defined for the following instruments: CIS (Δ5), SF-36 (Δ10), actometer (Δ10), self efficacy (Δ3), psychological attributions (Δ2.5), somatic attributions (Δ2), BDI (Δ5), and SCL-90 (Δ30). If the CI for the true difference lied entirely between −Δ and +Δ, equivalence was assumed.

RESULTS

Table 1 presents demographic and study variables of the 151 fatigued employees and the reference group of CFS patients. In both groups, the average duration of fatigue complaints was relatively long (fatigued employees 27.4 months, CFS patients 62 months). Among fatigued employees, the average score for physical functioning was below the cut off point (60 or lower) for functional impairment. Fatigued employees had high scores on exhaustion and cynicism, but also on professional efficacy.

Table 2 presents adjusted group means of fatigued employees who did not meet CFS criteria, stratified according to burnout (non-CFS-like employees, groups 1 and 2), fatigued

Table 1 Characteristics of participants in the study

	Fatigued employees on sick leave, n=151	CFS patients on sick leave, n=97
Demographic variables		
Sex (M/F)*	68/83 (45/55)	24/73 (25/75)
Age (years)	43.4 (8.3)	38.8 (8.9)
Educational attainment (1=low to 7=high)	3.8 (1.6)	4.4 (1.5)
Study variables		
Fatigue severity (CIS)	48.7 (6.2)	53.0 (3.5)
Duration of fatigue complaints in months	27.4 (29.5)	62.0 (64.5)
Duration of absenteeism in weeks	12.3 (4.9)	**
Physical functioning (SF-36)	59.9 (25.3)	**
Burnout (MBI-GS)		
Exhaustion	3.4 (1.5)	**
Professional efficacy	4.0 (1.1)	**
Cynicism	2.2 (1.3)	**
Psychological distress (SCL-90)	182.7 (50.5)	171.3 (41.8)
Depression (BDI)	14.8 (7.4)	14.2 (6.9)
General physical activity (actometer)	63.7 (25.7)	61.7 (20.1)
Self efficacy (self efficacy scale)	15.1 (3.5)	14.3 (3.4)
Psychological attributions (CAL)	12.3 (2.6)	9.6 (2.4)
Somatic attributions (CAL)	9.3 (2.5)	11.3 (2.3)

Data are mean (SD) or *number of participants (%).
**Data not available for CFS patients.

Table 2 Adjusted means* (95% CI) for fatigued employees according to CFS-like caseness and burnout caseness, CFS patients on sick leave, and group comparisons

	Non-CFS-like employees		CFS-like employees			Group comparisons‡	
Variable [scale]	Burnout (1), n=42	No burnout (2), n=43	Burnout (3), n=34	No burnout (4), n=32	CFS patients on sick leave (5) n=97	D	E
Self efficacy [5–24]	15.5 (14.5 to 16.6)	16.2 (15.1 to 17.2)	14.1 (12.9 to 15.2)	14.8 (13.6 to 15.9)	14.2 (13.5 to 14.9)	2–5	1–2 3–5 4–5
Psychological attributions [5–20]	13.4 (12.6 to 14.1)	11.7 (10.9 to 12.5)	12.5 (11.7 to 13.3)	11.0 (10.2 to 11.9)	9.7 (9.2 to 10.3)	1–2 1–4 1–5 2–5 3–5	1–3 2–3 2–4
Somatic attributions [4–16]	7.9 (7.2 to 8.6)	8.8 (8.1 to 9.5)	10.6 (9.8 to 11.3)	10.6 (9.8 to 11.4)	11.3 (10.8 to 11.8)	1–3 1–4 1–5 2–3 2–4 2–5	3–4 3–5 4–5
Depression† [0–63]	15.5 (12.6 to 18.4)	14.4 (11.6 to 17.2)	18.3 (15.1 to 21.4)	11.4 (8.2 to 14.7)	14.0 (12.1 to 15.9)	3–4	2–5
Psychological distress† [90–450]	185.7 (166.9 to 204.5)	176.7 (158.3 to 195.1)	206.9 (186.4 to 227.5)	160.0 (138.7 to 181.2)	171.7 (159.2 to 184.2)	3–4 3–5	
Physical activity [no scale]	63.1 (55.8 to 70.4)	71.8 (64.8 to 78.9)	73.9 (66.3 to 81.5)	64.1 (56.1 to 72.1)	61.7 (57.3 to 66.2)	**	**

*Means are adjusted for age and sex.
‡Group comparisons are shown if means are significantly different at p<0.05=D and/or equivalent=E (** = no significance or equivalence).
†Confidence interval (CI) is adjusted to 99% after interpretation of Levene's test of equality of error variances.
Non-CFS-like employees = fatigued employees who did not meet research criteria for CFS; CFS-like employees = fatigued employees who met research criteria for CFS.

employees who met CFS criteria, stratified according to burnout (CFS-like employees, groups 3 and 4), and diagnosed CFS patients who were absent from work on (long term) sick leave (group 5).

How many fatigued employees on sick leave met operational research criteria for CFS and burnout?

In total 66 (43.7%) fatigued employees fulfilled criteria for CFS and 76 (50.3%) fatigued employees fulfilled criteria for burnout. CFS-like employees were as likely to be a burnout case as non-CFS-like employees.

Did fatigued employees on sick leave who met CFS criteria differ from those who did not meet CFS criteria?

Since CFS-like employees and non-CFS-like employees were divided based on fatigue, duration of fatigue complaints, and physical functioning, differences between these groups on these variables were not tested. In both CFS-like employees and non-CFS-like employees, differences in fatigue (group means: (1) = 47.2; (2) = 47.0; (3) = 51.8; (4) = 50.2), duration of complaints (group means: (1) = 23.8; (2) = 18.8; (3) = 38.5; (4) = 25.9), and physical functioning (group means: (1) = 78.3; (2) = 71.9; (3) = 42.6; (4) = 37.9) between burnout cases and non-burnout cases (group 1 *v* 2, group 3 *v* 4) were not significant (not in table). In fact, some group means were assumed to be equivalent for burnout cases and non-burnout cases (fatigue, groups 1 and 2; physical functioning, groups 1 and 2, 3 and 4).

Differences emerged in causal attributions: burnt out non-CFS-like employees (group 1) had stronger psychological attributions than the non-burnout cases among CFS-like and non-CFS-like employees (groups 2 and 4), while CFS-like employees had stronger somatic attributions than non-CFS-like employees, regardless of burnout status. In addition, equivalence of psychological attributions scores was assumed between the two burnout groups (1 and 3) and between the two non-burnout groups (2 and 4), although this finding is counteracted by the equivalence between groups 2 and 3. Finally, burnt out CFS-like employees (group 3) were significantly more depressed and psychologically distressed than non-burnt out CFS-like employees (group 4).

There were no significant differences in self efficacy and physical activity, between CFS-like employees and non-CFS-like employees nor between burnout cases and non-burnout cases.

Did fatigued employees on sick leave who met CFS criteria differ from diagnosed CFS patients on sick leave?

Fatigue did not differ in CFS-like employees and CFS patients on sick leave (group means: (3) = 51.8; (4) = 50.2; (5) = 52.8): burnt out CFS-like employees (group 3) even had fatigue scores equivalent to those of CFS patients (not in table). CFS patients did have a longer duration of fatigue complaints than CFS-like employees (group means in months: (3) = 38.5; (4) = 25.9; (5) = 64.1), but the difference only reached significance between non-burnt out CFS-like employees (group 4) and CFS patients (not in table).

Burnt out CFS-like employees (group 3) had stronger psychological attributions and more psychological distress than CFS patients. Observed differences between CFS-like employees and CFS patients in somatic attributions, self efficacy, and depression were not significant and scores on somatic attributions and self efficacy between CFS patients and CFS-like employees were assumed to be equivalent.

DISCUSSION

In this study, we investigated associations with CFS and burnout in a sample of fatigued employees on sick leave.

First, we detected potential CFS cases among our sample of fatigued employees. More than 40% met the research criteria for CFS. Besides differences in fatigue, duration of complaints, and physical functioning due to the selection procedure, these "CFS-like employees" had stronger somatic attributions than those who did not meet CFS criteria. Compared to diagnosed CFS patients, CFS-like employees had comparable scores on fatigue, self efficacy, and somatic attributions but a shorter duration of fatigue complaints, indicating that CFS-like employees generally were in an earlier stage of illness than CFS patients.

To illuminate relations further, we stratified participants according to burnout status and found that half of the fatigued employees fulfilled criteria for burnout, almost equally distributed among CFS-like employees and non-CFS-like employees. Burnout among fatigued employees was only associated with psychological attributions and psychological problems. This was to be expected, since we defined burnout primarily as a negative state of mind accompanied by psychological problems. However, these associations were different for CFS-like employees and non-CFS-like employees: within the group of CFS-like employees, those who met burnout criteria were more depressed and distressed than those who did not meet burnout criteria, while burnout cases in the non-CFS-like group had stronger psychological attributions than non-burnout cases in either group. In addition, burnt out CFS-like employees had stronger psychological attributions and were more distressed than CFS patients.

With regard to the methodological restrictions of our study, it might have been insightful if we had been able to examine larger samples of independently recruited fatigued employees, diagnosed burnt out employees, and CFS patients using the same instruments. However, our approach provided us with sufficient information to answer several important questions. Since SF-36 data were not available for CFS patients, we were not able to determine the extent to which fatigued employees and CFS patients might differ in physical functioning.

In reviewing the results, we conclude that our sample of fatigued employees shared many important characteristics with CFS patients: severe fatigue, functional impairment, and a relatively long duration of complaints. Differences however concern the attribution to causal factors. CFS-like employees and CFS patients were more likely to attribute their condition to somatic factors than fatigued employees who did not meet CFS criteria, while burnt out employees had stronger psychological attributions than non-burnt out employees and CFS patients. This raises questions about the role of causal attributions: are they modified by the nature, persistence, and duration of complaints or are they factors that determine illness outcome?

Causal attributions are predictors of the course of CFS.[13 15 19] The manner in which a person labels his fatigue complaints, for instance as a temporary state because of temporary pressure at work (such as burnout) versus a chronic, persistent state that may last endlessly because of unknown somatic factors (such as CFS), might influence the course and duration of complaints. It is important to bear in mind that fatigued employees in this study who complied with CFS criteria were not diagnosed as such, and may never be aware of this "status": CFS-like employees (none had received a prior CFS diagnosis) were identified using operational research criteria for CFS, CDC symptom criteria[8] were not applied, and fatigued employees did not undergo physical examination. We are inclined to believe that many of these fatigued employees might have a better prognosis than "regular" CFS patients, not only because of the shorter duration of their fatigue complaints but also due to a different labelling of these complaints. Generally, not many CFS patients recover spontaneously from their complaints without adequate treatment.[11–15] If most fatigued employees do recover spontaneously, causal attributions might play a role. Butler and colleagues[18] have

suggested that the tendency to make somatic attributions might be a vulnerability factor for the development of CFS. We do not know if and how this applies to fatigued employees. In that sense, it is of great importance to identify the determinants of recovery in fatigued employees: if causal attributions can determine the course and outcome of fatigue complaints in employees, it might be an indication that early prevention of chronic fatigue lies partly in alterations of the labelling of fatigue complaints, for example with the use of cognitive behavioural techniques.

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