Fatigue as a predictor of work disability

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The objective of this study was to assess the predictive value of fatigue for work disability on medical grounds within the framework of a large prospective cohort study. Analyses were carried out on the data of 10 927 employees with a follow up of 32 months. We found that fatigue, as measured with the Checklist Individual Strength, was a strong predictor of subsequent permanent work disability. The for age, gender, presence of a chronic medical condition, and educational level adjusted relative risks were, for the 2nd, 3rd, and 4th fatigue score quartile against the first, respectively: 2.17 (1.17–4.03), 3.30 (1.67–6.52), and 12.8 (5.14–32.1).

Long spells of sickness absence can be regarded as an indicator of general ill health.[1] Sickness absence is an important occupational problem with high financial costs for companies and society, and is often related to a decreased quality of life of the workers involved. The aetiology of sickness absence is a multifactorial process. However, in workers on long term sick leave, or receiving a disability pension, the proportion of psychosomatic diseases, often related to a psychosocial aetiology, is found to be over 30%.[2] In the Netherlands, employees disabled for work for over one year of sick leave become eligible for a disablement benefit (WAO: Dutch Social Disability Insurance Act). The duration and level of the benefit depends on the age and loss of earning capacity; this means employees are compensated for the loss of wages the client sustains, not for the occurrence of the disease, illness, or handicap itself. Eligibility for the benefit is determined by a labour expert, and is based on a medical examination.[3] Despite recent political efforts to reduce the number of people receiving disability benefits in the Netherlands, this number remains very high (over 760 000, or over 10% of the Dutch labour force). As long term sick leave often has a strong psychosocial and/or work related component, early identification of high risk groups makes early intervention on psychosocial risk factors possible. Although work related factors (job strain, social support at work) have been associated with sick leave and work disability, their predictive power is rather low.[4–6] We hypothesised that feelings of fatigue might be a precursor of poor mental health status and could therefore potentially be a risk factor for future work disability.

METHODS

To assess whether the level of fatigue can be used to differentiate between workers at a low or high risk of permanent work disability (WAO) we analysed data from the Maastricht Cohort Study of fatigue at work. The design and conduct of this study has been described elsewhere.[7] In brief, in May 1998, 26 978 workers aged between 18 and 65, recruited from 45 companies were asked to participate in a study aimed at establishing risk factors, course, and outcome of work related fatigue. Of these, 12 140 employees (45%) completed a baseline questionnaire, containing questions concerning work, health, and fatigue. For the analysis described here, all workers who reported to be on sick leave or pregnant at baseline were excluded (n = 1029), as were workers who returned to work on a therapeutic basis (n = 184). This left 10 927 workers for analysis. Table 1 presents the baseline characteristics of the study population.

Every four months all participants received a short questionnaire concerning health and employment status. We used the data available for 32 months to identify whether and when, respondents became eligible for a disability pension (WAO case). During follow up, 70 WAO cases were reported. Fatigue was measured at baseline with the validated 20 item self reported Checklist Individual Strength (CIS) which has been described elsewhere.[8 9] In brief, the 20 items, scored on a seven point Likert scale, cover four aspects of fatigue (severity, concentration, motivation, and physical activity level). A composite CIS total score (ranging from 20 to 140) is calculated by

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Main messages

- Fatigue as measured with the Checklist Individual Strength is a strong predictor of work disability.

Policy implications

- Fatigue as measured with the Checklist Individual Strength might provide a useful way to detect patients at high risk of work disability.
- Detection of workers at high risk for long term work disability may enable early intervention, when workers are still at work.
- Further research is needed into whether a reduction of fatigue is feasible (possibly by cognitive behaviour therapy) and whether this leads to a reduced risk of work disability.

Table 1 Baseline characteristics

Variable	Percentage or mean
Gender	
Male	73.8%
Female	26.2%
Age	40.9 (8.9)
Educational level	
Low (primary, lower vocational, or lower secondary school)	31.9%
Intermediate (intermediate vocational or secondary school)	32.5%
Higher (higher vocational school or university	35.6%
Reporting a chronic condition	
No	76.8%
Yes	23.2%
CIS fatigue score	55.8 (22.7)

SD in parentheses where applicable.

Table 2 Relative risk of receiving a disability pension (WAO) according to baseline factors during 32 months of follow up

CIS fatigue score quartiles (cut off points)	Crude relative risk (95% CI)	Adjusted* relative risk (95% CI)
1st quartile (=38)	1†	1†
2nd quartile (>38, =54)	2.44 (1.33 to 4.50)	2.17 (1.17 to 4.03)
3rd quartile (>54, =74)	4.21 (2.16 to 8.18)	3.30 (1.67 to 6.52)
4th quartile (>74)	18.9 (7.81 to 46.1)	12.8 (5.14 to 32.1)

Cox proportional hazard model relative risks.
*Adjusted for age, gender, educational level, and presence of a chronic condition.
†Reference group.

adding all individual scores. The Crohnbach's alpha coefficient of this total CIS score was 0.93 for both males and females.[10] Cox proportional hazards modelling of the time to WAO was used to calculate the relative risk, adjusted for confounders, with use of SAS.[11] Visual inspection of the survival plots was performed to evaluate whether use of the Cox proportional hazards model was appropriate.

RESULTS

We were able to retrieve and code (following the ICPC coding) the diagnosis for the disability pension for 59 of the 70 cases; 32% were attributed to musculoskeletal disorders, 29% to mental disorders, 9% to cardiovascular disease, and 30% for other or unknown disorders.

An unadjusted relative risk for receiving a disability pension was found to be 2.08 (95% confidence interval (CI) 1.65 to 2.62) per standard deviation increase in fatigue score. Table 2 shows results for the crude and age, gender, educational level, and presence of a chronic condition adjusted relative risk for receiving a disability pension for the four quartiles of the CIS fatigue score. For the highest quartile of the fatigue score the adjusted relative risk of receiving a disability pension was found to be 12.8 (95% CI 5.14 to 32.1). A stratified analysis for respondents with and without a chronic condition showed, for age, gender, and educational level adjusted, relative risks for the subsequent fatigue quartiles of respectively 2.83 (0.93–8.63), 3.76 (1.20–11.8), and 16.62 (4.64–59.6) for the respondents with a chronic condition and 1.83 (0.84–3.96), 3.23 (1.32–7.92), and 7.20 (0.94–55.4) for the respondents without a chronic condition respectively. Adjustment for smoking or alcohol consumption, or stratification according to gender only resulted in small differences in the reported risks.

DISCUSSION

The current study shows that fatigue, as measured with the CIS questionnaire, is a strong predictor of a future disability pension. The conditions for receiving a disability benefit are different between countries. In the Netherlands, workers are only eligible for a disability pension after at least one year of (partial) sick leave. Further research is therefore needed exploring the power of this relation in countries with different social security legislation. Another topic for further research is whether fatigue is an indicator of underlying or early stages of a disease or whether fatigue has to be considered as an independent risk factor for future disease risk. Some support for the latter explanation comes from a study by Bültmann and colleagues,[10] showing that psychosocial risk factors (decision latitude, social support, and emotional, physical, and psychological demands) are correlated with an increased level of fatigue. Cognitive behaviour therapy, which has already been shown to be successful in reducing fatigue in people with chronic fatigue syndrome,[12] might prove a useful instrument in the reduction of long term sick leave and the number of new disability pensions. However, further study is needed to establish whether a reduction of fatigue is feasible and whether this leads to a reduced risk of work disability.

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