The relation between psychosocial risk factors and cause-specific long-term sickness absence

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Background: The aim was to study the impact of psychosocial risk factors on long-term sickness absence due to mental health problems (LSA-MH) or musculoskeletal disorders (LSA-MSD) in 2983 Belgian middle-aged workers.

Methods: Data were collected from 1372 male and 1611 female workers in the Belstress III study. Considered psychosocial risk factors were job demands, job control, social support, job strain, efforts, rewards, effort–reward imbalance and bullying. Prospective registered sickness absence data were collected during 12 months follow-up; the causes for long-term sickness absence episodes of at least 15 consecutive days were obtained by contacting the general practitioner of the worker. Multiple logistic regression models were used to investigate the relationship between the psychosocial risk factors and LSA-MH and LSA-MSD. Results: Higher levels of rewards at baseline were independently and significantly associated with a lower risk for LSA-MH. Higher levels of control were associated with a lower risk for LSA-MSD during follow-up. Higher job demands and efforts were significantly related to a lower risk for LSA-MSD. Finally, bullying was significantly and independently related to both LSA-MH and LSA-MSD during the follow-up period. Conclusions: These results suggest that psychosocial risk factors are related to LSA-MH and LSA-MSD, of which especially bullying seems to be a potent stressor.
Methods

Study population

The prospective Belstress III study was conducted in seven companies or public administrations across Belgium in 2004. All workers aged 30–55 years received a personal letter inviting them to volunteer. A total of 2983 workers joined in the study, resulting in a response rate of 30.4%. Analysis of the non-respondents revealed no important differences regarding age and gender.27

Data collection

At baseline, all participants completed a questionnaire including standardized measures for individual and socio-demographic variables, health behaviors and characteristics of the psychosocial work environment.

Independent variables

Work-related psychosocial risk factors were assessed, based on the JDCS1 and the ERI models,5 using 4-point Likert items. Sum scores were created for job demands (five items), job control (nine items) and social support (eight items). Job strain was defined as the ratio of job demands over job control.

Effort was assessed by the sum score of five items, measuring demanding aspects of the work environment. Reward was measured by the sum score of 11 items, containing financial reward, esteem, career opportunities and job security. To define the effort–reward imbalance, the effort–reward ratio, which is the sum score of effort divided by the sum score of reward, was calculated. Bullying was questioned using nine items mainly referring to isolation and destabilization, based on the scale of Quine.28 Response categories on every question were ‘yes, absolutely’, ‘rather yes’, ‘rather no’ and ‘absolutely not’. The sum score for the nine items was calculated.

Cronbach’s alpha’s for the scales were acceptable (>0.75), except for job demands. All scales were entered in the models as continuous variables.

Confounding factors

Several individual and socio-demographic variables were questioned, including age, gender and educational level. Low educational level was defined as completing the primary school and the first 3 years of secondary school; medium education was defined as completing secondary school; and high education was defined as completing high school or university.

Respondents were questioned about several health indicators and behaviours, such as current smoking habits (yes/no), alcohol use (average number of units per week day and weekend day), weight and height and physical activity outside work. For alcohol use, the average number of units per week was computed. Body mass index (BMI) was calculated as the self-reported weight divided by the squared height (kg/m²). Physically active persons were considered to sport or to do strenuous physical activities during minimal 20 min, at least twice a week.

Five items from the Job Content Questionnaire were included to assess the level of physical demands and the sum score for this scale was calculated.1

To evaluate the amount of stress outside work, an 8-item–based scale regarding problems in private life was used.29 For the measurement of symptoms of depression, the sum score of the 11-item scale of the Centre for Epidemiological Studies—Depression scale was applied.30 To assess the presence of low back problems, the workers were also questioned about the total number of days they perceived low back pain during the past year. Response categories were 0, 1–7, 8–30, >30 days and every day.

Sickness absence data

The sickness absence data were collected prospectively during 12 months follow-up, starting from the day on which the questionnaire was filled out. The data were obtained from the personnel administration departments of the participating companies. In Belgium, a medical certification for absences of >1 day is required, to benefit from guaranteed salary and medical insurance. Subsequently, the sickness absence registration is expected to be highly accurate. Complete sickness absence data could be gathered for 2876 participants; 107 were lost during follow-up. This drop out was mainly due to resignation or dismissal, and not attributable to health-related reasons. In case of long-term sickness absence of at least 15 consecutive days, the cause was retrieved by contacting the general practitioner of the worker. A total of 522 long-term sickness absence episodes were registered, of which the reason could be acquired in 290 cases.

Among these cases, 95 were classified as LSA-MH and 85 were categorized as LSA-MSD.

The majority of the LSA-MH cases concerned depression. The LSA-MSD mainly included low back disorders, repetitive strain injuries of the upper limbs and neck disorders.

Statistical analysis

Chi-square tests or Mann–Whitney U tests were conducted to assess the differences in socio-demographics, health behaviours and psychosocial work characteristics between the subsample with/without LSA-MH and LSA-MSD.

The relation between the psychosocial risk factors and, respectively, LSA-MH and LSA-MSD was examined, using multiple logistic regression analysis. In model 1, crude odds ratios (ORs) were calculated and are presented per one standard deviation (SD) increase in the exposure variable. Next, interaction terms between gender and the psychosocial risk factors were tested. None of them were significant at the level of $P<0.10$. We thus did not stratify for gender. In a further step, the ORs were adjusted for several confounders, considered as probable risk factor for sickness absence.2 The following covariates were considered: gender, age, educational level, smoking habits, alcohol use, BMI, physical demands at work and stress outside work. Moreover, in the model assessing the ORs for LSA-MH, the depressive symptoms scale was also entered as a confounder, while in the model calculating the ORs for LSA-MSD, the number of days perceiving low back pain was used as confounder. The fully adjusted models were reduced by eliminating the non-significant ($P>0.10$) confounders, while forcing the psychosocial risk factor in the model. This backward procedure was conducted to avoid overadjustment given the relatively low number of outcome events (model 2).

Models were screened for multicollinearity according to the calculation of Variance Inflation Factors, which revealed no problems. All models were evaluated at 95% significance level ($P<0.05$). The analyses were conducted using PASW 19.0 software.

Results

Descriptive analyses

The study population consisted of 1372 men (46%) and 1611 women (54%) who were employed within three (semi-)public administrations (53% of the sample), three companies from the service sector (39%) and one manufacturing company (8%). The majority of the participants (72%) worked full-time.

Four workers were excluded from the analysis, as they had both types of cause-specific sickness absence. This resulted in a sample with LSA-MH consisting of 81 workers, while the group with LSA-MSD comprised 91 workers. Description of the psychosocial risk factors and confounding variables for both the total sample and

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Psychosocial risk factors for LSA-MSD

After adjustment, the model reveals that higher levels of control were associated with a lower risk for LSA-MSD (OR/SD increase = 0.73; 95% CI = 0.58–0.98). Similarly to LSA-MH, reporting higher levels of bullying was associated with a higher risk for LSA-MSD (OR/SD increase = 1.29; 95% CI = 1.06–1.58). Finally, reporting higher job demands and efforts were associated with a lower risk for LSA-MSD (OR/SD increase job demands = 0.77; 95% CI = 0.60–0.98; OR/SD increase efforts = 0.76; 95% CI = 0.60–0.95) (table 3).

Table 2 Results from the multivariate logistic regression analysis for psychosocial risk factors at work and long-term sickness absence (>15 consecutive days) due to mental health problems

<table>
<thead>
<tr>
<th>Psychosocial risk factor</th>
<th>Model 1</th>
<th>Model 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OR (95% CI)</td>
<td>P</td>
</tr>
<tr>
<td>Job demands(^{a,b,i})</td>
<td>1.18 (0.95–1.47)</td>
<td>0.126</td>
</tr>
<tr>
<td>Job control(^{a,i})</td>
<td>0.70 (0.58–0.86)</td>
<td>0.001</td>
</tr>
<tr>
<td>Support at work(^{a,i})</td>
<td>0.63 (0.51–0.78)</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Job strain(^{a,i})</td>
<td>1.34 (1.13–1.60)</td>
<td>0.005</td>
</tr>
<tr>
<td>Efforts(^{a,i})</td>
<td>1.10 (0.88–1.39)</td>
<td>0.397</td>
</tr>
<tr>
<td>Rewards(^{a,i})</td>
<td>0.61 (0.49–0.76)</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Effort-Reward imbalance(^{a,i})</td>
<td>1.43 (1.18–1.72)</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Bullying(^{a,i})</td>
<td>1.61 (1.33–1.94)</td>
<td>&lt; 0.001</td>
</tr>
</tbody>
</table>

Notes. Significant associations at the 0.05 level are in bold.
Model 1—Crude model.
Model 2—Results of the backward analysis: covariates retained in the final model are listed next to the risk factor. Following covariates were initially entered in the analysis: age (\(^{a}\)), gender (\(^{b}\)), educational level (\(^{d}\)), body mass index (\(^{d}\)), alcohol consumption (\(^{e}\)), physical activity (\(^{f}\)), stress outside work (\(^{g}\)), physical demands at work (\(^{h}\)), smoking (\(^{i}\)), baseline depressive symptoms (\(^{j}\)).
Table 3 Results from the multivariate logistic regression analysis for psychosocial risk factors at work and long-term sickness absence (>15 consecutive days) due to musculoskeletal problems

<table>
<thead>
<tr>
<th>Psychosocial risk factor</th>
<th>Model 1</th>
<th></th>
<th>Model 2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OR (95% CI)</td>
<td>P</td>
<td>OR (95% CI)</td>
<td>P</td>
</tr>
<tr>
<td>Job demands</td>
<td>0.93 (0.74–1.15)</td>
<td>0.501</td>
<td>0.77 (0.60–0.98)</td>
<td>0.030</td>
</tr>
<tr>
<td>Job control</td>
<td>0.65 (0.53–0.79)</td>
<td>&lt;0.001</td>
<td>0.73 (0.58–0.91)</td>
<td>0.003</td>
</tr>
<tr>
<td>Support at work</td>
<td>0.83 (0.68–1.03)</td>
<td>0.093</td>
<td>0.91 (0.73–1.13)</td>
<td>0.417</td>
</tr>
<tr>
<td>Job strain</td>
<td>1.31 (1.10–1.55)</td>
<td>0.002</td>
<td>1.09 (0.90–1.32)</td>
<td>0.382</td>
</tr>
<tr>
<td>Effort</td>
<td>0.84 (0.68–1.04)</td>
<td>0.112</td>
<td>0.76 (0.60–0.95)</td>
<td>0.016</td>
</tr>
<tr>
<td>Rewards</td>
<td>0.74 (0.58–0.91)</td>
<td>0.002</td>
<td>0.80 (0.64–1.02)</td>
<td>0.067</td>
</tr>
<tr>
<td>Effort–Reward imbalance</td>
<td>1.16 (0.95–1.42)</td>
<td>0.145</td>
<td>1.06 (0.84–1.34)</td>
<td>0.604</td>
</tr>
<tr>
<td>Bullying</td>
<td>1.47 (1.23–1.76)</td>
<td>&lt;0.001</td>
<td>1.29 (1.06–1.58)</td>
<td>0.011</td>
</tr>
</tbody>
</table>

Notes. Significant associations at the 0.05 level are in bold.
Model 1—crude model
Model 2—Results of the backward analysis: covariates retained in the final model are listed next to the risk factor.
Following covariates were initially entered in the analysis: age (\(^{a}\)), gender (\(^{b}\)), educational level (\(^{c}\)), body mass index (\(^{d}\)), alcohol consumption (\(^{e}\)), physical activity (\(^{f}\)), stress outside work (\(^{g}\)), physical demands at work (\(^{h}\)), smoking (\(^{i}\)), baseline back complaints (\(^{j}\)).

Discussion

The present study examines the impact of psychosocial working characteristics on both LSA-MH and LSA-MSD in a cohort of 2876 Belgian workers. The findings of this prospective study add new insights to the existing literature, as some dimensions of the ERI model and especially bullying were also revealed as risk factors for cause-specific sickness absence.

A significant effect on LSA-MH was demonstrated for both rewards and bullying, which are two aspects of the psychosocial work environment not earlier investigated regarding this specific outcome. This finding suggests that higher rewards could lower sickness absence due to mental health problems, while neither efforts nor the ERI score predicted LSA-MH. Bullying seems to be an important independent risk factor for LSA-MH. Although the relation between bullying and sickness absence due to mental health problems was not formerly investigated, the result is consistent with expectations. Sickness absence as reaction on the exposure to bullying can be considered as a coping behavior (escaping from the detrimental working environment), but also as an attempt to recover from the mental health impact. In contrast with the existing literature, we found no effect of job demands, job control or social support on LSA-MH.\(^{30,23–24}\) It should however, be noted that these studies are not comparable with respect to the study population, the length of follow-up period and the applied definition of mental health-related sickness absence.

As suggested by several authors, low job control was retained as a significant psychosocial risk factor for LSA-MSD.\(^{31,32}\) Several explanations are made to understand how control may impact musculoskeletal disorders. A first possibility is that for employees ‘control’ also comprises control over the physical demands. Second, a decreased control may also affect perceived stress, which successively modifies muscle tension. Finally, control possibly modifies muscle tension. As a result, control possibly influences sympathetic or adrenocortical activity, causing peripheral changes in muscles and pain perception. Low support was not a risk for LSA-MSD in our study population, which is in line with the findings of Ijzelenberg,\(^{25}\) but contrasted the conclusion of several other authors.\(^{13–20}\) These conflicting results may be explained by the use of different questionnaires assessing social support or different measures for the outcome. Surprisingly, both job demands and efforts seemed to lower the risk for LSA-MSD. This finding is in contrast with former results, demonstrating that job demands are a risk for musculoskeletal disorders. However, similar protective effects of work pace on sickness absence due to back pain were observed in the Whitehall study.\(^{31}\) This finding was attributed to the fact that high pace among these British civil servants would be an indicator of doing varied work. Accordingly, high work pace implies task variation, which probably is more related to high control. Additional analysis, forcing both job demands/efforts and control in a model, revealed that this significant relation disappeared, which supported this hypothesis. Finally, bullying was also an important predictor of LSA-MSD. To our knowledge, no previous research has investigated the effect of this specific psychosocial risk factor on sickness absence due to musculoskeletal disorders. Although earlier research has established the association of workplace bullying and several health problems,\(^{10,36}\) the relation between bullying and musculoskeletal complaints was only investigated by a few authors, revealing this stressor as a risk factor for musculoskeletal complaints.\(^{35}\)

Our data thus demonstrated that bullying is a potent psychosocial stressor, being a predictor for several types of cause-specific sickness absence. One can hypothesize that sickness absenteeism is a coping mechanism, rather than a reflection of a real health problem.\(^{37}\) However, because our sickness absence data were based on objectively registered figures and reasons of sickness absence ≥15 days were retrieved by the general physician of the worker, we can suggest that bullying seems to be a real threat to the victim’s health.

To the authors’ knowledge, this is the first study assessing several aspects of the psychosocial work environment in relation to cause-specific sickness absence. However, there are some limitations that have to be mentioned.

First, the fairly low response rate can lead to a selection bias in the population. Although no important differences in age and gender were revealed, we were unfortunately not able to examine whether non-respondents differed from respondents with respect to sickness absence levels. However, this type of bias could have resulted in an underestimation of the relations. Second, the participants of the Belstress III study were not recruited from a representative sample of the Belgian working population. Therefore, caution should be made in generalization of the results. Nevertheless, representativeness is less crucial in analytical studies like this one, where possible causal relationships are examined.\(^{38}\) Another selection bias could have been caused by the drop out of 107 workers during follow-up and workers of whom the cause of long-term sickness absence could not be retrieved. Additional analysis revealed no significant difference in psychosocial risk factors and baseline self-reported sickness absence between the included group and the workers lost during follow-up or without information about the cause of long-term sickness absence. Also the applied backward procedure can be discussed. However, we decided to follow this technique to retain a
limited number of confounding factors. This was necessary because only a restricted number of outcome events were available in our study group, which made the need to create a model with few confounding variables even more crucial. Nonetheless, additional analysis forcing all the confounding covariates into the model resulted in roughly similar conclusions. The limited number of outcome events hampered stratification for gender. Although previous research demonstrated gender differences in all-cause sickness absence, which was partly attributed to job stress,27 preliminary analysis revealed no significant interaction effects. This allowed conducting the analysis on the entire group. Finally, the use of continuous exposure variables, which made the ORs less easily interpretable, can be subject of debate. However, this prevented a loss of information by dichotomizing the scales and maintained a consistent approach for all risk factors. Moreover, additional analysis performed with dichotomous variables resulted in similar conclusions.

A major strength of our study is the prospective follow-up of the sickness absence data. Second, the data enabled investigating the relation with multiple psychosocial risk factors, which exceeded the application of the leading JDCS model by including dimensions of the ERI model and bullying. Third, the results were based on registered objective absenteeism measurements. Finally, this study allowed adjusting for several potential confounders, particularly baseline depressive symptoms and back complaints.

In conclusion, our study demonstrates that low rewards were a risk factor for LSA-MH. Psychosocial risk factors important for LSA-MSD were low demands, low efforts and low job control. Bullying was a potent risk factor, contributing to both LSA-MH and LSA-MSD. Some recommendations can be made for research: studies investigating the effect of psychosocial risk factors on health and absenteeism have to consider bullying as a potential stressor. The main implication for management, planning strategies to reduce absenteeism have to consider bullying as a potential stressor. The results suggest a relation between specific dimensions of the JDCS and the ERI models and sick leave due to musculoskeletal and mental health problems.

Bullying seems to be a potent stressor, as it was significantly and independently related to both types of cause-specific sick leave.

Management strategies dealing with absenteeism due to musculoskeletal and due to mental health problems should also take into account bullying prevention.

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**Conflicts of interest:** None declared.

**Key points**

- The results suggest a relation between specific dimensions of the JDCS and the ERI models and sick leave due to musculoskeletal and mental health problems.
- Bullying seems to be a potent stressor, as it was significantly and independently related to both types of cause-specific sick leave.
- Management strategies dealing with absenteeism due to musculoskeletal and due to mental health problems should also take into account bullying prevention.

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Retirement and a healthy lifestyle: opportunity or pitfall? A narrative review of the literature

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Background: Retirement is a life-course transition in late adult life that is marked by major changes that may affect healthy lifestyles. Our aim is to give an overview of the current knowledge on changes in smoking, alcohol consumption, physical activity and dietary habits during the transition to retirement. This may provide clues to a better targeting and timing of preventive activities at older age. Methods: Literature search in Medline, Scopus, Embase, PsycInfo, Social SciSearch and Scielo limited to English-language papers published between 2001 and May 2013. Results of 20 original papers are summarized in a narrative review. Results: Some studies report an increase in alcohol consumption after retirement, whereas others found a decrease or no change at all. Those who retired involuntarily tended to increase their alcohol consumption, whereas retirees who quit voluntarily did not change their alcohol consumption. Leisure-time physical activity seems to increase slightly after retirement, especially moderately intense physical activity. This increase does not compensate the loss of work-related physical activity such as the work itself or work-related transportation. The studies on changes in smoking and dietary habits were too limited to draw conclusions. Conclusions: The transition to retirement is accompanied with both favourable and unfavourable lifestyle changes, depending on the type of lifestyle, lifestyle indicator and the personal situation of the retiree. The (pre-)retirement period may well offer a suitable opportunity for preventive action, for example in pre-retirement programmes, planning or other retirement-related support.

Introduction

Retirement is a life-course transition in late adult life that is marked by major changes that may affect healthy lifestyles. The absence of work activities and restrictions affect daily routines and time availability. Moreover, retirement is often accompanied by changes in identity and changes in social contacts and social activities. Also, retirement may lead to a decrease in income. Due to all these changes, retirees’ priorities, way of life and healthy lifestyles are likely to change as well. Retirement may affect healthy lifestyle changes through several mechanisms, as increased leisure time and loss of restrictions, changing social contacts, stress and reorientation on health. The circumstances surrounding the retirement may influence these changes, especially if retirees frame their retirement as voluntary or not.

Adopting a healthy lifestyle is by no means easy at older age. Supporting the adoption of a healthy lifestyle at the right moment is therefore an important public health issue. Major life transitions such as retirement could present a window of opportunities for prevention. Information about the nature of lifestyle changes...