

# Workplace Bullying as a Predictor of Disability Retirement

## *A Prospective Registry Study of Norwegian Employees*

Morten Birkeland Nielsen, PhD, Jan Shahid Emberland, MSc, and Stein Knardahl, PhD

**Objective:** The aim of this study was to determine 1) whether bullying is related to all-cause disability retirement, 2) whether bullying contributes to the variance in disability retirement above high job demands and lack of job control, and 3) to establish gender differences in the relationship. **Methods:** Survey data from 14,501 Norwegian employees on exposure factors linked to registry data on all-cause disability retirement. **Results:** Bullying significantly predicted risk of disability retirement (hazard ratio = 1.55; 95% confidence interval = 1.13 to 2.12). This relationship remained statistically significant after adjusting for job demands and lack of job control. Women had the highest risk of disability, but both bullied men and women had a higher risk of disability than nonbullied employees of the same gender. **Conclusion:** Bullying is a risk factor for disability retirement. Measures taken to prevent bullying may be beneficial for reducing both health problems and disability retirement.

Compensation for disability may be appropriate for those who have a permanently reduced earning capacity due to illness or injury. However, early retirement from working life due to disability incurs costs for society, and with a high number of recipients, the disability insurance scheme places a heavy burden on the welfare state and insurance companies. The proportion of the working-age population receiving disability pension in Norway was 10% in 2008—The Organisation for Economic Co-operation and Development (OECD) average being 6% (OECD, 2010: 59). This proportion seems to be stable. In 2014, the Norwegian Labour and Welfare Administration reported that 9.4% of the population aged 18 to 67 years was disability pensioners. There are gender differences in the prevalence of disability retirement, as 11.1% women and 7.1% men were disability pensioners in 2014.

To be able to reduce the disability retirement rate, it is necessary to identify factors that promote or inhibit both health and work ability. Knowledge about psychosocial work exposures may be especially important,<sup>1</sup> but only a few factors have been studied to this date.<sup>2,3</sup> Of the factors examined, one review showed that there is moderate evidence for the role of low control and for the combination of high demands and low control as predictors of disability retirement.<sup>3</sup> Another review found that low control, monotonous work, job strain, effort-reward imbalance, a lack of social support, problems related to the organization of work, and

### Learning Objectives

- Become familiar with previous evidence on health and occupational impacts of bullying in the workplace.
- Summarize the new findings on the association between workplace bullying and risk of disability retirement.
- Identify the role of other factors potentially affecting the relationship between bullying and work disability, including gender and psychosocial work environment.

leadership behaviors are related to an increased risk of disability.<sup>2</sup> Hence, there is a shortage of knowledge about other exposures and it is likely that there exist some under-explored risk factors.<sup>3</sup> Workplace bullying, defined as a situation wherein an employee persistently and systematically is exposed to harassment at work and wherein this employee finds it difficult to defend him- or herself against the harassment,<sup>4</sup> has been highlighted as a potential cause of disability retirement.<sup>5</sup> Leymann<sup>6</sup> claimed that, unless a managerial intervention takes place, bullying will continue to escalate until it reaches a final “expulsion stage” where the target is forced out of his or her job or current position. As many targets of bullying will experience difficulties in finding and maintaining new employment later on, bullying increases the risk of being removed from working life altogether.

Although bullying has been found to increase the risk of subsequent health problems<sup>7–9</sup> and sickness absence,<sup>10</sup> the empirical evidence for bullying as a precursor to disability retirement is scarce and findings are somewhat mixed with some studies supporting bullying as a precursor,<sup>5,11–13</sup> whereas others provide ambiguous findings.<sup>14</sup> In addition, there is lack of evidence on the relative impact of bullying given the influence of other work exposures and the impact of gender on the association has not been established. The overarching objective of this study was to determine relationships between victimization from bullying at the workplace and subsequent all-cause disability retirement. The following three research questions constituted the basis for the investigation:

1. Is workplace bullying a significant risk factor for all-cause disability retirement?
2. Is the impact of workplace bullying on risk of disability gender-dependent?
3. Does bullying have a unique contribution to the variance in disability retirement when adjusting for job demands and job control?

## METHODS

### Study Design

This study is a part of the research project: “The new workplace II: work factors, sickness absence, and exit from working life among Norwegian employees.” The study protocol provides a full description of the research project, procedure, and data material, including demographic information.<sup>15</sup> The project is based on a questionnaire survey combined with official registry data on disability benefits. The survey part comprises data from a large sample

From the National Institute of Occupational Health, Oslo, Norway (Dr Nielsen, Mr Emberland, Dr Knardahl).

The study was supported by a grant from the Norwegian research council (237788).

Authors Nielsen, Emberland, and Knardahl have no relationships/conditions/circumstances that present potential conflict of interest.

The JOEM editorial board and planners have no financial interest related to this research.

Address correspondence to: Morten Birkeland Nielsen, PhD, National Institute of Occupational Health, PB 8149 Dep, N-0033 Oslo, Norway (morten.nielsen@stami.no).

This is an open access article distributed under the terms of the Creative Commons Attribution-Non Commercial-No Derivatives License 4.0 (CCBY-NC-ND), where it is permissible to download and share the work provided it is properly cited. The work cannot be changed in any way or used commercially without permission from the journal.

Copyright © 2017 The Author(s). Published by Wolters Kluwer Health, Inc. on behalf of the American College of Occupational and Environmental Medicine.

DOI: 10.1097/JOM.0000000000001026

of adults employed in a full time or part-time position. Subjects were recruited from organizations in Norway that were contacted and offered to participate in the study. At the organizational level, this sampling procedure was based on a convenience approach with no pre-defined criteria for participation. All employees, excluding those on sick leave, were mailed a letter with information about the survey that explained the aims of the project and assured that responses would be treated confidentially, in strict accordance with the general guidelines and specific license from The Norwegian Data Protection Authority. The survey was web-based, although participants with limited access to computers at work were given the option of filling out a paper version of the questionnaire. About 85% of the sample responded to the survey using the electronic survey form.

### Ethical Approval

This project has been approved by the Regional Committees for Medical and Health Research Ethics (REC) in Norway, has permission from The Norwegian Data Protection Authority, and was conducted in accordance with the World Medical Association Declaration of Helsinki. All study participants provided their informed consent. When accessing the web-based questionnaire by a personal login code, informed consent had to be confirmed before responding to the questionnaire. This consent procedure was approved by The Norwegian Data Protection Authority and REC. Respondents were treated anonymously in the data analyses. Only respondents who actively (by response) permitted the linking of their answers to registries were included in this study. For the respondents consenting to registry linkage, we had access to information on disability pension compensation recorded in the Norwegian Labour and Welfare Administration registry up to January 1, 2015.

### Respondents

From November 2004 to March 2014, organizations encompassing a total of 30,585 employees were invited to participate in the survey for the first time. At the time of invitation, 28,883 subjects were aged 18 to 62 years and eligible for disability pension. Employees aged 62 to 66 years may benefit from disability pension but are also entitled to early statutory pension. Consequently, subjects above 62 years of age were excluded from the present study, as we did not have access to the statutory pension registry. Of the subjects eligible to disability pension only, 16,651 responded to any of the exposure measures in the questionnaire relevant to this study (Response rate: 57.6%). Altogether, 14,501 permitted linking their responses to official registry data on sickness absence and disability retirement from the Norwegian Labour and Welfare Service (Acceptance rate: 87.1%). Employees who had or did receive disability pension at the time of administration of the questionnaire (due to some proportion of already reduced work ability;  $n = 495$ ) were excluded from the analysis.

### Questionnaire Instruments

#### Workplace Bullying

Victimization from bullying was measured with a previously validated single item question from the General Nordic Questionnaire for Psychological and Social Factors at Work (QPS<sub>Nordic</sub>; 16). This single-item approach is in line with the well-established self-labeling method for assessing bullying and provides a valid measurement of the respondent's subjective interpretation of being bullied.<sup>16</sup> After being presented the following definition of workplace bullying: "Bullying and harassment (badgering, niggling, offending somebody) is a problem at some workplaces and for some workers. To label something bullying or harassment, the offensive behavior has to occur repeat-ably over a period of time, and the person confronted has to experience difficulties defending

himself/her-self. The behavior is not bullying or harassment if two parties of approximately equal 'strength' are in conflict or the incident is an isolated event," respondents were asked whether they had been subjected to bullying at the workplace during the last 6 months. The response categories were "yes" and "no."

*Job demands* and *lack of job control* were assessed with validated scales from the QPS<sub>Nordic</sub>.<sup>17,18</sup> The job demands dimension included items that assessed the respondents' experience of quantitative demands (four items; Cronbach alpha = 0.75) and decision demands (three items; Cronbach alpha = 0.63). The job control dimension included items that assessed the respondents' experience of decision control (five items, Cronbach alpha = 0.73) and control over work intensity (four items; Cronbach alpha = 0.82). The scales were constructed with the following frequency scoring: "1 = very seldom or never," "2 = rather seldom," "3 = sometimes," "4 = rather often," and "5 = very often or always." To retain consistency in effect directions for all predictor variables, the job control scales were recoded (ie, a high score on job control indicates lack of control).

### Registry Data on Disability Retirement

On the basis of informed consent from participants, survey data were linked to the sickness and disability benefit register of the Norwegian Labour and Welfare Administration by the unique 11-digit National identity number. The registers provide complete records of disability retirement that are compensated by the national insurance sickness benefit.<sup>19</sup> All residents of Norway are members of the National Insurance Scheme. Residents aged 18 to 66 years who have been a member of the National Insurance Scheme for at least three consecutive years before the onset of disease, illness, or injury are eligible for the disability pension scheme.<sup>20</sup> A disability pension is only granted to those with a physician-certified reduction in the ability to work of minimum 50%. In general, the disability pension is granted on a permanent basis. That is, the recipient receives the pension until he or she dies or is transferred to retirement pension at the age of 67 (NOU, 2007:4). The present study investigated all-cause disability retirement.

### Statistical Analysis

SPSS 23.0 (IBM, Armonk, NY) and R version 3.2.2 (survival package) were used to analyze the data. Scale variables (ie, job demands and lack of job control) were treated as continuous variables in the analyses. Hazard ratios (HRs) and 95% confidence intervals (95% CIs) were calculated with Cox regression analysis to determine the impact of workplace bullying, job demands, and lack of job control as risk factors for postresponse disability retirement event. Cox regression (or proportional hazards regression) is a method for investigating the effect of several variables upon the time at which a specified event takes place. As recommended for studies in healthy populations,<sup>21</sup> attained age (at censoring/event) was the underlying time scale in these analyses rather than "time-on-study" (ie, years since baseline response). The use of age as a time scale variable made age adjustment redundant in the Cox-regressions. Gender was included as a covariate in all adjusted analyses. Subjects were censored at the end of follow-up (January 1, 2015) or earlier in case of death, emigration, or reaching the eligible age for early statutory pension (62 years). Median follow-up time for the respondents was 5.8 years (maximum follow-up time 10.1 years). We tested the proportional hazards assumption by the testing of nonzero slopes, and by graphing scaled Schoenfeld residuals. No violations of the assumption were detected (for all variables:  $>0.05$ ).

## RESULTS

### Prevalence Rates and Demographic Characteristics

Altogether, 4.4% ( $N = 553$ ) of the sample entered the disability retirement scheme during the study period. Demographic

**TABLE 1.** Demographic Characteristics for Study Sample

	<i>N</i>	%	Prevalence Disability Retirement (%)	Group Difference Disability Retirement (X2)
Gender				
Male	5,461	44.4	6.4	
Female	6,842	55.6	2.0	140.15 <sup>a</sup>
Age				
<30	1,559	12.8	3.6	
30–39	3,183	26.1	3.3	
40–49	3,480	28.5	4.4	
50–59	2,632	21.6	6.9	
>59	1,353	11.1	3.0	57.89 <sup>a</sup>
Educational level				
<9 years	328	3.6	15.2	
10–12 years	2,915	31.8	5.2	
13–16 years	4,056	44.2	4.0	
>16 years	1,869	20.4	1.7	132.75 <sup>a</sup>
Employment				
Full time employee	9,710	91.1	4.3	
Temporary employee	579	5.4	3.3	
Substitute	298	2.8	4.7	
Other	66	0.6	1.5	2.78 <sup>NS</sup>
Leadership position				
No	7,565	79.3	4.2	
Middle manager	1,739	18.2	3.5	
Senior manager	238	2.5	1.3	6.30 <sup>b</sup>

NS, not significant.  
<sup>a</sup>*P* < 0.001.  
<sup>b</sup>*P* < 0.05.

characteristics for the sample and bivariate associations between demographic characteristics and disability retirement are presented in Table 1. The overall sample characteristics suggest that the sample is quite heterogeneous. Female respondents had significantly higher likelihood of entering disability retirement than male respondents. Risk of disability decreased significantly with higher levels of education. Nonleaders had a significantly higher risk for entering disability retirement than respondents in leadership position. Type of employment was not associated with the risk of all-cause disability retirement.

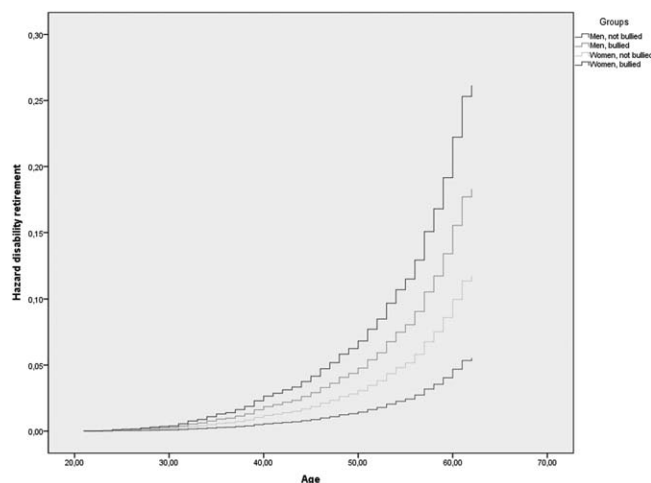
In total, 5.5% of the sample was reported to have been victimized by bullying within the last 6 months before survey participation. There was no significant differences between genders ( $\chi^2 = 0.15$ ; *df* = 1; *P* > 0.05) and educational levels ( $\chi^2 = 6.23$ ; *df* = 3; *P* > 0.05), with regard to victimization from bullying. Non-leaders (5.9%) reported significantly ( $\chi^2 = 17.07$ ; *df* = 1; *P* < 0.001) higher prevalence rates of bullying than respondents in leadership position (3.5%).

**Direct and Moderated Associations Between Workplace Bullying and Disability Retirement**

An unadjusted model was fitted to examine the bivariate associations between workplace bullying and all-cause disability retirement. The findings suggested an increased risk of disability retirement among those victimized by bullying (HR = 1.55; 95% CI = 1.13 to 2.12). With regard to gender differences, the findings indicate that bullying is a risk factor for disability among both men and women (Fig. 1). Compared with the reference group comprising nonbullied male employees, nonbullied women (HR = 2.13; 95% CI = 1.17 to 3.88), bullied men (HR = 3.31; 95% CI = 2.63 to 4.17), and bullied women (HR = 4.74; 95% CI = 3.14 to 7.16) had all a significantly higher risk of disability retirement.

**The Relative Impact of Workplace Bullying on Disability Retirement**

To determine whether bullying contributed to the variance in disability retirement above job demands and lack of job control, a model that adjusted for the shared variance of gender and these work factors was fitted. As displayed in Table 2 (model 2), the association between bullying and disability retirement remained significant (HR = 1.45; 95% CI = 1.04 to 2.04) after adjusting for gender (HR = 2.73; 95% CI = 2.17 to 3.43), lack of control over work pacing (HR = 1.30; 95% CI = 1.17 to 1.45), lack of control over decisions (HR = 1.24; 95% CI = 1.07 to 1.43), quantitative demands



**FIGURE 1.** Interaction between age, gender, and bullying with regard to risk of disability.

**TABLE 2.** The Impact of Workplace Bullying, Demographic Factors, Job Demands, and Job Control on Later All-Cause Disability Retirement: Unadjusted and Adjusted Analyses

	Model 1 HR	Model 1 95% CI	Model 2 HR	Model 2 95% CI	Model 3 HR	Model 3 95% CI
Workplace bullying (ref. cat.: not bullied)						
No (Ref.cat)	—	—	—	—	—	—
Yes	1.55 <sup>b</sup>	1.13–2.12	1.45 <sup>a</sup>	1.04–2.04	1.18	0.76–1.85
Decision demands	0.91	0.81–1.03	0.85 <sup>a</sup>	0.73–0.98	0.86	0.72–1.02
Quantitative demands	1.00	0.89–1.11	1.13	0.98–1.29	1.24 <sup>a</sup>	1.05–1.47
Lack of control over work pace	1.50 <sup>c</sup>	1.39–1.62	1.30 <sup>c</sup>	1.17–1.44	1.25 <sup>b</sup>	1.10–1.43
Lack of control over decisions	1.67 <sup>c</sup>	1.50–1.87	1.24 <sup>a</sup>	1.07–1.43	1.27 <sup>a</sup>	1.05–1.54
Gender (ref. cat.: men)						
Men (Ref.cat)	—	—	—	—	—	—
Women	3.29 <sup>c</sup>	2.67–4.05	2.73 <sup>c</sup>	2.17–3.43	2.42	1.81–3.24
Educational level						
<9 years (Ref.cat)	—	—	—	—	—	—
10–12 years	0.56 <sup>c</sup>	0.40–0.77	—	—	0.79	0.51–1.24
13–16 years	0.47 <sup>c</sup>	0.34–0.65	—	—	0.81	0.52–1.28
>16 years	0.23 <sup>c</sup>	0.15–0.36	—	—	0.44 <sup>a</sup>	0.24–0.79
Leadership position (ref.cat.: no)						
No (Ref.cat)	—	—	—	—	—	—
Yes	0.60 <sup>c</sup>	0.46–0.79	—	—	0.88	0.62–1.25

Note. Ref. cat.: Reference category.

Model 1: Bivariate, unadjusted associations.

Model 2: Association between workplace bullying and disability adjusted for other work exposures and gender.

Model 3: Association between workplace bullying and disability adjusted for other work exposures and all demographic characteristics.

<sup>a</sup> $P < 0.05$ .

<sup>b</sup> $P < 0.01$ .

<sup>c</sup> $P < 0.001$ .

(HR = 1.13; 95% CI = 0.98 to 1.29), and decision demands (HR = 0.85; 95% CI = 0.73 to 0.98).

Workplace bullying was not significantly associated with disability retirement when demographic characteristics were added to the model (model 3, Table 2). In this full model, quantitative demands (HR = 1.24; 95% CI = 1.05 to 1.47), lack of control over work pacing (HR = 1.25; 95% CI = 1.10 to 1.43), lack of control over decisions (HR = 1.27; 95% CI = 1.05 to 1.54), female gender (HR = 2.42; 95% CI = 1.81 to 3.24), and more than 16 years of education (HR = 0.44; 95% CI = 0.24 to 0.79) emerged as significant predictors of disability retirement.

## DISCUSSION

The main aims of this study were to determine a) whether victimization from workplace bullying was associated with an increased risk of all-cause disability retirement; b) whether the effect of workplace bullying on risk of disability was dependent on gender, and c) whether bullying contributes uniquely to the risk for disability retirement after accounting for the impact of other work-related predictors. With regard to the direct relationship between bullying and disability, the results showed that reporting victimization from workplace bullying was associated with a 55% excess risk for later disability retirement when other variables were not considered. In response to the second research questions, we found that although bullied women had the highest overall risk of disability retirement, both men and women victimized by bullying had a higher risk of disability retirement than nonbullied colleagues of the same gender. Bullying remained a significant predictor of disability retirement after adjusting for the impact of quantitative job demands, decision demands, lack of control over work pace, and lack of control over decisions. However, bullying was not significantly associated with disability retirement in the model that included both work exposures and demographic characteristics.

The established direct relationship between bullying and disability retirement is in line with the limited body of research on this specific association.<sup>5,11–14</sup> Taken together, the findings from this and previous studies support theoretical models of bullying and work ability<sup>22,23</sup> by demonstrating that victims of bullying are at a significantly greater risk of exit from working life than their nonbullied colleagues. By showcasing a relatively novel consequence of workplace bullying, the current study also advances previous research on health outcomes<sup>7,9</sup> and sickness absence<sup>10</sup> emphasizing bullying as an essential detriment stressor in contemporary working life.

A criterion in most social security scheme systems is that a disability retirement is caused by reduced health capacities. A logical inference is therefore that the established association between bullying and disability is explained by a process where bullying leads to increased health problems and that this impairment subsequently erodes the work ability of those targeted. This reduction in work ability will thereafter increase the risk of disability. Consequently, bullying in itself cannot be considered as a direct antecedent to disability and there is a need to establish health impairment as an indirect mechanism. As bullying has been found to be especially related to mental distress and muscle-skeletal complaints,<sup>9</sup> both of these health problems are likely candidates for mediators and should be examined as such in upcoming research. In support of health problems as mediating variables, Sterud<sup>14</sup> found that an association between bullying and self-reported withdrawal from work due to own ill-health bullying became insignificant after adjusting for psychological distress. According to the author, this points to distress as a potential mediating factor between bullying and risk of work disability.

The gender-specific findings from this study show that bullying is related to an increased risk of disability retirement among both men and women. Hence, although women in general have a higher likelihood of disability than men, our findings show that bullying is a risk factor for disability irrespective of gender.

The finding that bullying provides a significant contribution to the variance in disability even after adjusting for other work factors suggests that the association is relatively robust. Bullying should therefore be considered as an important risk factor in the theoretical models on the work-related causes of disability retirement. However, it should be noted that bullying was not associated with disability retirement when adjusting for both work factors and demographic characteristics. There are several explanations for this finding. First, it may be that the combination of demographic variables examined in this study outweighs the impact of bullying. However, it may also be that there are interactions between bullying and other factors that we have not uncovered in this study. Finally, it may simply be that the full model examined in this study is overadjusted and that the mutual impact of all variables suppresses the contribution of workplace bullying.<sup>24</sup>

### Methodological Strengths and Limitations

The present study examined relationships between workplace bullying, health, and disability retirement in a large sample using a combination of questionnaire survey- and objective registry data. The sample comprised employees from a range of different Norwegian organizations and industries. Variables were assessed using extensively tested measurement instruments and the survey had a response rate in line with the estimated average for organizational surveys.<sup>25</sup> Although the sample was large, participating organizations were recruited through convenience sampling methods, thus limiting the external validity of the findings. However, as all employees in the organizations were invited to participate, the sample can be described as a probability sample at the individual level.<sup>26</sup>

As the measurement instruments for the exposure factors and the health complaints are self-report measures, the data may have been influenced by problems that are common to self-report methodology, such as response set tendencies. However, the QPS<sub>Nordic</sub> instrument used to assess job demands and job control should be rather insensitive to respondents' emotions or personality dispositions. QPS<sub>Nordic</sub> -items are constructed with the aim of avoiding emotive content and social desirability bias in that subjects report frequency of occurrence rather than degrees of agreement or satisfaction and items do not address issues that are inherently negative or positive.<sup>27</sup> Workplace bullying was measured with a single item self-labeling question. Although there are limitations with single-item measures, there are also potential advantages, such as cost-efficiency, greater face validity, and the increased willingness of respondents to take the time to complete the questionnaire when the number of items is reduced. Single-item measures can be reliable, as estimated by test-retest correlations,<sup>28</sup> correlate strongly with multiple-item scales,<sup>29</sup> and can predict outcomes effectively (eg, <sup>30</sup>). The self-labeling method employed in this study is a frequently used approach within bullying research and has been established as a valid and reliable assessment of victimization from workplace bullying.<sup>16,17</sup>

### Conclusions and Implications

This study contributes to the literature on bullying and disability in three ways. First, it is among the first prospective studies to include official registry data on disability retirement. Second, it highlights that workplace bullying is a risk factor for all-cause disability retirement for both men and women. Third, it demonstrates that bullying contributes to the risk of disability retirement over and above some other working conditions. The established relationship between bullying and disability retirement suggests that bullying has detrimental consequences both for exposed employees and for organizations in which the bullying occur. Hence, the findings support previous claims about bullying as

a severe problem in the psychosocial working environment.<sup>9</sup> Interventions aimed at preventing retirement from work due to illness and/or disease in the general working population may benefit from focusing on reducing the occurrence of workplace bullying, although our findings also show that control over decisions and work pacing also are important risk factors for disability. In addition, gender differences should also be considered in interventions. As bullying may lead to disability, sound and effective primary and secondary interventions should be prioritized in order to improve the work ability of targeted employees. In cases where targets experience reduced work ability due to bullying, tertiary interventions will be important. However, a more nuanced picture of mechanisms and moderators that can explain how and when bullying is related to disability retirement is necessary in order to develop effective measures and interventions for targeting bullying and disability.

### ACKNOWLEDGMENTS

The authors would like to thank Anne Lene Andersen Watn, Bjørn Lau, Elisabeth Petersen, Jan Olav Christensen, Margrethe Schøning, and Shahrooz Elka for their participation in the administration of the questionnaire survey. We would like to thank the participating companies for their involvement in this study.

### REFERENCES

- Niedhammer I, Chastang JF, Sultan-Taieb H, Vermeylen G, Parent-Thirion A. Psychosocial work factors and sickness absence in 31 countries in Europe. *Eur J Public Health*. 2013;23:622–629.
- Dragano N, Schneider L. [Work related psychosocial factors and the risk of early disability pensioning: a contribution to assessing the need for rehabilitation]. *Rehabilitation (Stuttg)*. 2011;50:28–36.
- Knardahl S, Johannessen HA, Sterud T, et al. The contribution from psychological, social, and organizational work factors to risk of disability retirement: a systematic review with meta-analyses. *BMC Public Health*. 2017;17:176.
- Einarsen S, Hoel H, Zapf D, Cooper CL. The concept of bullying and harassment at work: the European tradition. In: Einarsen S, Hoel H, Zapf D, Cooper CL, editors. *Bullying and Harassment in the Workplace. Developments in Theory, Research, and Practice*. 2nd ed., Boca Raton, FL: CRC Press; 2011. p. 3–40.
- Berthelsen M, Skogstad A, Lau B, Einarsen S. Do they stay or do they go? A longitudinal study of intentions to leave and exclusion from working life among targets of workplace bullying. *Int J Manpower*. 2011;32:178–193.
- Leymann H. Mobbing and psychological terror at workplaces. *Violence Vict*. 1990;5:119–126.
- Verkuil B, Atasayi S, Molendijk ML. Workplace bullying and mental health: a meta-analysis on cross-sectional and longitudinal data. *PLoS One*. 2015;10:e0135225.
- Nielsen MB, Einarsen S. Outcomes of workplace bullying: a meta-analytic review. *Work Stress*. 2012;26:309–332.
- Nielsen MB, Magerøy N, Gjerstad J, Einarsen S. Workplace bullying and subsequent health problems. *Tidsskr Nor Lægeforen*. 2014;134(12/13): 1233–1238.
- Nielsen MB, Indregard AM, Øverland S. Workplace bullying and sickness absence: a systematic review and meta-analysis of the research literature. *Scand J Work Environ Health*. 2016;42:359–370.
- Dellve L, Lagerstrom M, Hagberg M. Work-system risk factors for permanent work disability among home-care workers: a case-control study. *Int Arch Occup Environ Health*. 2003;76:216–224.
- Glabek M, Skogstad A, Einarsen S. Take it or leave: a five-year prospective study of workplace bullying and indicators of expulsion in working life. *Ind Health*. 2015;53:160–170.
- Leinonen T, Pietilainen O, Laaksonen M, Rahkonen O, Lahelma E, Martikainen P. Occupational social class and disability retirement among municipal employees: the contribution of health behaviors and working conditions. *Scand J Work Environ Health*. 2011;37:464–472.
- Sterud T. Work-related psychosocial and mechanical risk factors for work disability: a 3-year follow-up study of the general working population in Norway. *Scand J Work Environ Health*. 2013;39:468–476.

15. Nielsen MB, Christiansen S, Indregard AM, Emberland JS, Elka S, Knardahl S. The new workplace II: protocol for a prospective full-panel registry study of work factors, sickness absence, and exit from working life among Norwegian employees. *SpringerPlus*. 2016;5:243.
16. Nielsen MB, Notelaers G, Einarsen S. Measuring exposure to workplace bullying. In: Einarsen S, Hoel H, Zapf D, Cooper CL, editors. *Bullying and Emotional Abuse in the Workplace. Developments in Theory, Research and Practice*. Boca Raton, FL: CRC Press; 2011. p. 149–176.
17. Dallner M, Elo A-L, Gamberale F, et al. *Validation of the General Nordic Questionnaire (QPSNordic) for psychological and social factors at work*. Copenhagen: Nordic Council of Ministers; 2000.
18. Wannstrom I, Peterson U, Asberg M, Nygren A, Gustavsson JP. Psychometric properties of scales in the General Nordic Questionnaire for Psychological and Social Factors at Work (QPS(Nordic)): confirmatory factor analysis and prediction of certified long-term sickness absence. *Scand J Psychol*. 2009;50:231–244.
19. Strömholm T, Pape K, Ose SO, Krokstad S, Bjørngaard JH. Psychosocial working conditions and sickness absence in a general population: a cohort study of 21,834 workers in Norway (The HUNT Study). *J Occup Environ Med*. 2015;57:386–392.
20. Ingelsrud MH. Disability retirement and public sector reorganization: hospital mergers in Norway. *Acta Sociol*. 2016;59:35–50.
21. Korn EL, Graubard BI, Midthune D. Time-to-event analysis of longitudinal follow-up of a survey: choice of the time-scale. *Am J Epidemiol*. 1997;145:72–80.
22. Nielsen MB, Hoel H, Zapf D, Einarsen S. Exposure to aggression in the workplace. In: *The Wiley Blackwell Handbook of the Psychology of Occupational Safety and Workplace Health*. Chichester, UK: Wiley-Blackwell; 2016. p. 205–227.
23. Djurkovic N, McCormack D, Casimir G. The physical and psychological effects of workplace bullying and their relationship to intention to leave: a test of the psychosomatic and disability hypotheses. *Int J Organ Theory Behav*. 2004;4:469–497.
24. Spector PE, Brannick MT. Methodological urban legends: the misuse of statistical control variables. *Organ Res Meth*. 2011;14:287–305.
25. Baruch Y, Holtom BC. Survey response rate levels and trends in organizational research. *Hum Relat*. 2008;61:1139–1160.
26. Ilies R, Hauseman N, Schwochau S, Stibal J. Reported incidence rates of work-related sexual harassment in the United States: using meta-analysis to explain reported rate disparities. *Person Psychol*. 2003;56:607–631.
27. Christensen JO, Knardahl S. Work and headache: a prospective study of psychological, social, and mechanical predictors of headache severity. *Pain*. 2012;153:2119–2132.
28. Littman AJ, White E, Satia JA, Bowen DJ, Kristal AR. Reliability and validity of 2 single-item measures of psychosocial stress. *Epidemiology*. 2006;17:398–403.
29. Wanous JP, Reichers AE, Hudy MJ. Overall job satisfaction: how good are single-item measures? *J Appl Psychol*. 1997;82:247–252.
30. Nagy M. Using a single-item approach to measure facet job satisfaction. *J Occup Organ Psychol*. 2002;75:77–86.