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Workplace bullying and depressive symptoms: A prospective study among junior physicians in Germany

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ABSTRACT

Objective: The relationship between workplace bullying and depression may be bi-directional. Furthermore, it has been suggested that the depressogenic effect of bullying may only become evident after reasonable periods of follow-up (i.e., >1 year). As prospective evidence remains sparse and inconsistent, we used data from a three-wave prospective study to disentangle this potentially bi-directional relationship.
Methods: In 2004, 621 junior hospital physicians participated in a survey and were followed-up 1.2 years and 2.8 years later. Prospective analyses were restricted to participants with complete data at all assessments ($n = 507$ or 82%). To measure workplace bullying, a description of bullying at work was provided followed by an item inquiring whether the respondent felt she/he had been exposed. Depressive symptoms were assessed by the state scale of the German Spielberger's State-Trait Depression Scales.
Results: Multivariate linear regression suggested that workplace bullying at baseline predicted increased depressive symptoms both after 1 year ($b = 1.43$, $p = 0.01$) and after 3 years of follow-up ($b = 1.58$, $p = 0.01$). Multivariate Poisson regression models revealed that the depressive symptom z-score at baseline was associated with an increased risk of bullying at the 3-year follow-up (relative risk [RR] = 1.49, 95% confidence interval [CI] = 1.13–1.97). This association was less pronounced after 1 year of follow-up (RR = 1.19, 95% CI = 0.90–1.59).
Conclusions: Our study suggests bi-directional associations between depressive symptoms and victimization from bullying at the workplace. Future prospective studies are needed to examine underlying biopsychosocial mechanisms.

Introduction

While a uniform definition of workplace bullying is lacking, there is consensus on some of its key features: Bullying in the workplace is considered present if an individual feels mistreated by superiors and/or colleagues [1]. Workplace bullying is assumed to evolve gradually, and to be encountered repeatedly and for extended periods of time while the victim feels to have limited or lacking resources to take a stand against the experienced negative acts [1,2]. Bullying behaviors may include verbal hostility, attempts to hamper the victim's work performance and social exclusion [3], and these behaviors are considered to exert their detrimental effects as they accumulate across time [4]. Bullying in the workplace represents a frequent phenomenon, especially among health care staff [5–7], and has been found to increase the risk of numerous adverse health outcomes, including psychological stress [8], chronic pain [9], cardiovascular disease [3], and, as a corollary, increased absenteeism [10].

A potential health-related sequel of workplace bullying which has received increasing attention is depression. Research has suggested that the relationship between workplace bullying and depression might be bi-directional [3]. Disentanglement of such reciprocal associations is best achieved and documented by prospective cohort studies. To date, only few studies have however applied such designs to examine this bi-directionality [3–5,11]. Moreover, those investigations have yielded inconsistent results. Two of these prior studies found that depression is predictive of incident exposure to bullying at work [3,11]. Conversely, two prospective investigations identified exposure to workplace bullying as a risk factor for depression [3,5]. Other studies did not confirm that observation [11] or replicated it only among men, but not among women [4].

Notably, the authors of the study, that failed to show an association between workplace bullying and subsequent depressive symptoms—Reknes et al. [11]—hypothesized that their study's relatively short follow-up duration (i.e., 1 year) may partly explain their nil finding, because depression may only emerge as a delayed response to bullying.

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This hypothesis was based on insights from a qualitative study by Niedl, exploring, among others, coping strategies of bullying victims [12]. That investigation drew on the Exit-Voice-Loyalty-Neglect (EVLN) model [13], which conceptualizes how employees may respond to their job dissatisfaction. Responses may include quitting the job (exit), active problem solving by raising the issue (voice), staying at the job while hoping for the problem to be solved some day (loyalty), and reduction of efforts at work or focus of non-work interests (neglect). Niedl observed that coping responses evolved over time: most bullying victims initially engaged into active problem-solving (voice) and some responded with loyalty [12]. As these responses were probably ineffective in coping with victimization from bullying [11], most employees subsequently reduced their commitment to their work (neglect) or quit their job (exit). These specific coping dynamics have been confirmed by other studies [14] and have informed the hypothesis that depression occurs in responses to workplace bullying only with some delay (i.e., more than 1 year), that is, once initial coping strategies (voice and loyalty) have failed, and victims respond with depression and engage into more destructive coping strategies (i.e., neglect and exit) [11].

To improve our understanding of the bullying–depression relationship, it is of interest to provide prospective data to add to the currently limited and inconsistent evidence base. Ideally, such data should allow for the examination of bi-directional associations based on more than two measurement points [11]; in particular, based on the above-mentioned hypothesis, it would be of interest to conduct analyses for different periods of follow-up (i.e., 1 year versus longer periods of time). We therefore set out to determine the prospective associations between workplace bullying and depressive symptoms based on a design with three measurement points which allowed for analyses based on 1 year of follow-up as well as 3 years of follow-up.

Methods

Study population

Detailed information on the design of this study and its procedures has been presented elsewhere [15]. Briefly, in 2004, we mailed questionnaires to a random sample of 1,000 junior physicians working in hospitals in Southern Germany in their second or third year of medical residency. A total of 621 junior physicians participated in these baseline assessments and completed similar questionnaires 1.2 after baseline (1-year follow-up; year 2005) and 2.8 years after baseline (3-year follow-up; year 2007). Each questionnaire covered, among others, respondents' evaluation of their current occupational conditions, education, health-related lifestyles, and mental health. To be able to compare our findings for different periods of follow-up, we decided to limit the current study to junior physicians who had participated in all three surveys ($n = 507$ or 82% of the baseline sample). This study was approved by the Institutional Review Board of the Medical Faculty of the Ludwig-Maximilians-University Munich (No. 016/04).

Questionnaire data

Exposure to bullying was operationalized by the following specification and question: "Workplace bullying refers to a situation where someone is subjected to social isolation or exclusion, his or her work and efforts are devalued, he or she is threatened, derogatory comments are made about him or her in his or her absence, or other negative behavior that is aimed to torment, wear down, or frustrate the victim occur. Have you been subjected to such bullying?" Responses were recorded as 1 = "yes," 0 = "no." This question has been used in previous studies [3,10]. Depressive symptoms were measured by the state scale of the German Spielberger's State-Trait Depression Scales [16,17]. The state scale assesses the current experience of characteristic cognitive and affective symptoms of depression by 10 statements. Respondents are asked to endorse their level of agreement on a 4-point Likert scale ("not at all" to "very much so"). The resulting sum score has a potential range between 10 and 40 with higher scores indicating higher levels of depressive symptoms. The state subscale had a high internal consistency in our study as indicated by Cronbach's alphas of 0.9 at each measurement point.

Statistical analyses

Workplace bullying as a predictor of depressive symptoms

The potential relationship between exposure to workplace bullying at baseline and subsequent depressive symptoms at the 1-year follow-up or the 3-year follow-up was examined by linear regression models. These models were first corrected for potentially confounding effects of age, sex, and the baseline depression score. In a next step, these models were additionally adjusted for total working hours per week, having a partner, heavy alcohol consumption, physical activity, overweight/obesity, and prevalent disease (any versus none). These potential confounders were identified based on their previously documented associations with depressive symptoms or workplace bullying [18–24].

Depressive symptoms as predictors of being bullied at work

Utilizing data from baseline participants reporting not to be bullied ($n = 441$), we examined the potential association of depressive symptoms at baseline and incident workplace bullying by Poisson regression with a log-link function and the empirical (robust) variance [25]. Incident bullying by depressive symptoms was expressed as risk ratios (RRs) together with corresponding 95% confidence intervals (95% CIs). Again, we conducted separate analyses for different periods of follow-up. First, we examined baseline depressive symptoms as a predictor of incident bullying at the 1-year follow-up (i.e., bullying reported at the 1-year follow-up by those not bullied at baseline). Second, we ran corresponding models predicting incident bullying at the 3-year follow-up. To maximize the statistical power, we utilized the depressive symptom variable as a continuous *z*-score in our primary analytical approach. In additional analyses, we dichotomized the depressive symptom score based on tertiles of its distribution at baseline (i.e., a score within the top tertile versus the remaining tertiles) or quartiles (i.e., a score within the top quartile versus a score in the remaining quartiles). The confounder adjustment was consistent with our analyses of bullying as a predictor of subsequent depressive symptoms (see above). Analyses were carried out using SAS 9.2 (SAS Institute Inc., Cary, North Carolina, USA).

Results

The mean age of the study population equaled 30.5 years at baseline showing little variation (standard deviation [SD]) = 2.6). The mean depressive symptoms baseline score was 18.4 (SD = 4.8). As much as 12.9% of the participants reported at baseline that they had been bullied at work. This prevalence increased to 14.9% 1 year after baseline and to 15.9% 3 years after baseline. As shown in Table 1, about half of the sample was female and worked 50 or more hours per week. Roughly three quarter had a partner and about every fifth participant was overweight or obese, while 71.2% were physically active, and 11.9% reported heavy alcohol consumption. The presence of any chronic disease was reported by 22.5%.

Victimization from workplace bullying was particularly common in study participants who worked 50 h or more per week, who did not have a partner, who were overweight/obese, who reported heavy alcohol consumption, and who had a chronic disease. Likewise, depressive symptoms were elevated in participants who reported long working hours, having no partner, being overweight/obesity, engaging into heavy alcohol consumption, and having a chronic disease. We conducted dropout analyses comparing those who had been excluded from the present analyses ($n = 114$) with the analytical sample in terms of their depression scores, the prevalence of bullying, and the characteristics shown in Table 1. We did not observe significant differences between these two samples.

Exposure to bullying at baseline was associated with elevated depressive symptoms both after 1 year and after 3 years ($b = 1.43$, $p = 0.01$, and $b = 1.58$, $p = 0.01$, respectively, see Table 2). As shown in Table 3, the 1-year risk of incident bullying increased by 19% with every one SD increase of the depressive symptoms score at baseline. This relationship did not reach statistical significance however (RR = 1.19,

Table 1
Baseline characteristics of the study population ($n = 507$).

Characteristic		Total sample	Exposure to workplace bullying, *n* (%)	Mean depression score (SD[a])
Age in years, *n* (%)	<30	205 (40.4)	24 (11.7)	18.0 (4.5)
	≥30	302 (59.6)	41 (13.6)	18.7 (5.0)
Sex, *n* (%)	Men	247 (48.7%)	28 (11.3)	18.2 (4.5)
	Women	260 (51.3)	37 (14.3)	18.6 (5.1)
Working hours	<50	227 (45.3)	19 (8.4)	17.8 (4.3)
per week, *n* (%)	≥50	274 (54.7)	43 (15.8)*	18.9 (5.1)*
Having a partner, *n* (%)	No	116 (22.9)	23 (19.8)	19.3 (5.4)
	Yes	391 (77.1)	42 (10.8)*	18.2 (4.6)*
Being overweight	No	416 (82.2)	49 (11.8)	18.2 (4.6)
or obese, *n* (%)	Yes	90 (17.8)	16 (18.0)	19.4 (5.4)*
Physically active, *n* (%)	No	146 (28.8)	13 (9.0)	18.8 (5.0)
	Yes	361 (71.2)	52 (14.4)	18.3 (4.7)
Heavy alcohol consumption,	No	423 (88.1)	51 (12.1)	18.3 (4.8)
n (%)	Yes	57 (11.9)	11 (19.3)	19.2 (5.3)
Any disease reported,	No	393 (77.5)	44 (11.2)	17.9 (4.3)
n (%)	Yes	114 (22.5)	21 (18.6)*	20.3 (5.9)*

[a] SD = standard deviation.
* Significance differences ($p < 0.05$) based on chi-squared tests (bullying) or *t*-tests (depression score).

95% CI = 0.90–1.59). This positive association was more pronounced and significant when we examined exposure to workplace bullying by the 3-year follow-up as an outcome (RR = 1.49, 95% CI = 1.13–1.97). Analyses of dichotomized depressive symptom variables suggested that individuals with a score in the highest tertile (versus the remaining tertiles) and in the upper quartile (versus remaining quartiles) were at 54% and 57% increased risk of being bullied at the 1-year follow-up. Despite their reasonable magnitude, these association measures did not reach conventional thresholds of significance testing. Again, these associations were more pronounced and statistically significant when incident bullying was examined across 3 years of follow-up (RR upper tertile vs other tertiles = 1.88, 95% CI = 1.02-–3.47; RR upper quartile vs other quartiles = 1.97, 95% CI = 1.09- 3.57).

Discussion

The present study examined the longitudinal relationships between workplace bullying and depressive symptoms among junior physicians across a 1-year follow-up and a longer follow-up period (i.e., 3 years). We observed that workplace bullying at baseline predicted elevated depressive symptoms both after 1 year and after 3 years. Conversely, we also found depressive symptoms to predict reported workplace bullying; that association only reached significance across 3 years of follow-up as those estimates were more pronounced than after 1 year of follow-up.

Previous research and contributions to the literature

A specific rationale for our study was provided by the assumption that depression may emerge as a consequence of workplace bullying only after a considerable period of time (i.e., more than 1 year) [11]. This notion was consistent with findings from two longitudinal studies with a 2-year follow-up which have suggested that workplace bullying represents a risk factor for depression [3,5]. That evidence is supplemented by a more recent study [4], which documents that victimization from bullying predicts depression across a 5-year follow-up among men, but not women. Our study offered a unique opportunity to examine prospective associations between workplace bullying and subsequent depressive symptoms across 1 and 3 years of follow-up. Our results do not corroborate the hypothesis that depressive symptoms in response to workplace bullying require considerable periods of time to emerge, i.e., beyond 1 year since reporting of victimization from bullying. This notion has neither received confirmation by recent research, suggesting that bullying predicts elevated depressive symptoms across 1 year [26]. Overall, the empirical evidence accrued to date mainly suggests that workplace bullying predicts depressive symptoms or depression and that the nature of this association is not contingent upon the duration of the follow-up period.

Concerning the opposite direction of effect, that is, depressive symptoms predicting subsequent exposure to workplace bullying, our study confirms this association when examined across 3 years of follow-up. These associations were also evident and of meaningful magnitude after 1 year of follow-up—albeit those estimates did not reach statistical significance. It seems likely though that our study sample was too small to detect those associations with statistical significance. Our observations add to mixed findings from prior longitudinal research. A study among Finnish hospital staff [3] as well as a study of Norwegian nurses [11] suggested that those with depression were more likely to be bullied after 1 year and 2 years of follow-up, respectively. Longitudinal cohort studies among female eldercare workers from Denmark [5] and the Norwegian workforce [4] were however unable to confirm this finding. Future longitudinal studies are needed to add to this evidence.

Potential explanations

Several explanations, which are partially interrelated, have been proposed for the bi-directional relationships of workplace bullying and depressive symptoms. One theoretical framework to understand how bullying may contribute to depressive symptoms is provided by the cognitive trauma theory [27]. This theory postulates that humans hold basic assumptions about the world they live in. These beliefs include that the world is benevolent and meaningful and that one self is a worthy asset to that world. Events are considered traumatic if they undermine these basic beliefs. Repeated and prolonged exposure to the hostile acts characteristic for bullying (i.e., social isolation) likely destruct these positive views of the world and the self [28,29], thereby leading to profound psychological stress [4,8], which, in turn, increases the risk of depression [30]. Alternatively or additionally, the experience of victimization from bullying may be viewed as a stressful life event. There is abundant evidence that adverse life events, including interpersonal conflict, increase an individual's susceptibility to depression [31]. The adverse life events most relevant to depression share a distinct set of features which are also characteristic for bullying, such as threat, humiliation, and uncontrollability of events [31]. In particular, the perceived uncontrollability of victimization from bullying (which can be conceptualized as failure to cope with it) [31] may induce a state of learned helplessness. Learned helplessness, in turn, may then initiate cognitive responses (e.g., increased reactivity to bullying and reduced

Table 2
Depressive symptoms at the 1-year-follow-up or the 3-year follow-up by exposure to workplace bullying at baseline.

		Depressive symptoms after 1 year						Depressive symptoms after 3 years					
		Model I[a]			Model II[b]			Model I[a]			Model II[b]		
		b	*β*	*p*-value	*b*	*β*	*p*-value	*b*	*β*	*p*-value	*b*	*β*	*p*-value
Being bullied at baseline	No	ref			ref			ref			ref		
	Yes	1.27	0.09	0.02	1.43	0.10	0.01	1.64	0.11	0.01	1.58	0.11	0.01

[a] Adjusted for age and sex, and depression score at baseline.
[b] Adjusted for age and sex, depression score at baseline, total working hours per week, having a partner, heavy alcohol consumption, physical activity, overweight/obese, and presence of any disease.

Table 3
Risk of being bullied at the 1-year follow-up or the 3-year follow-up by depression at baseline.

Characteristic		Incident bulling after 1 year				Incident bulling after 3 years			
		Model I[a]		Model II[b]		Model I[a]		Model II[b]	
		RR	95% CI	RR	95% CI	RR	95% CI	RR	95% CI
Depression *z*-score		1.28	0.95–1.71	1.19	0.90–1.59	1.52	1.16–1.98	1.49	1.13–1.97
Depression cutoff at tertile[c]	Low	1	ref			1	ref		
	High	1.84	0.96–3.52	1.54	0.83–2.87	2.10	1.16–3.81	1.88	1.02–3.47
Depression cutoff at quartile[d]	Low	1	Ref	1	Ref	1	Ref	1	Ref
	High	1.87	0.95–3.72	1.57	0.81–3.03	2.21	1.20–4.09	1.97	1.09–3.57

[a] Adjusted for age and sex.
[b] Adjusted for age, sex, total working hours per week, having a partner, heavy alcohol consumption, physical activity, overweight/obese, and presence of any disease.
[c] High depressive symptoms defined a highest tertile of the score distribution (total score of 20+) vs remaining tertiles.
[d] High depressive symptoms defined a highest quartile of the score distribution (total score of 21+) vs remaining quartiles.

motivation to engage in active coping) and additional subsequent pathophysiological responses [31] ultimately contributing to the development of depression [32].

Another factor potentially increasing the risk of depression in victims from bullying is their reduced self-esteem [33,34]. Notably, according to a recent meta-analysis, the effect of self-esteem on depression is more pronounced than the effect of depression on self-esteem [34]. Thus, self-esteem may rather be a conducive factor for the association between bullying and subsequent depression, but less so for the opposite direction of effect. In addition, bullying likely results in perceptions of reduced social support at work and in perceived social isolation, both of which are risk factors for increasing depressive symptoms [35,36]. In interaction with or alternatively to the above-mentioned cognitive factors, the relationship between bullying (if conceptualized as a stressor) and depression may be explained by physiological mediators, such as inflammatory processes [37,38] and/or reduced of vagal tone [39,40]. Considering how, in turn, depressive symptoms may increase the risk of being bullied at work, one needs to bear in mind that employees with depressive symptoms may suffer from reduced self-efficacy and work ability and thus perform poorer at work. This may make them a potential target of bullying behavior in their workplace [3]. Furthermore, according to the "gloomy perception mechanism" [41], individuals with poor mental health are more likely to perceive behaviors of colleagues and superiors as hostile and thus will be more likely to report exposure to workplace bullying.

Methodological considerations

It would have been of interest to examine factors potentially underlying the observed associations, e.g., as mentioned above, shattered basic assumptions about the self and the world, feelings of helplessness, self-esteem, or physiological markers. Such data were unfortunately unavailable in our study. While our indicator of workplace bullying has shown its utility in previous research [3,10], it provides a rather global estimate. Our assessment would have benefitted from information on additional key characteristics of workplace bullying [2], such as the frequency of bullying, the duration of exposure (i.e., 6 or 12 months), its intensity, the victim's perceived inability to defend himself/herself, and reports of specific bullying behaviors. Such information had, among others, improved our case definition: We cannot rule out that our operationalization of workplace bullying extends to very mild cases (e.g., individuals with short-term and transient exposures) and cases with exposure episodes experienced during the professional years before baseline assessment (the mean duration of prior employment was 2.7 years with SD = 1.2).

Our measurement of depression was based on a validated and widely used tool. This scale, however, lacks an established clinical cutoff to define (possible or probable) depression. Utilization of such a variable had added further clinical depth and value to our study. Moreover, while we drew on a reasonably large sample, its size was too small to conduct sex-stratified analyses, which had been of interest in light of previous findings [4]. Strengths of our study include the ability to draw on data from three measurement points across 3 years, which enabled us to conduct separate analyses for different durations of follow-up. Another asset is that we were able to obtain a good response rate across those three measurement points (82% of the baseline sample). In addition, our study was based on a sample of early career employees who were in their second and third year of medical residency. These properties reduce the likelihood of selection bias (e.g., healthy worker effects), which was supported by our dropout analyses. Furthermore, we were able to adjust our analyses for a range of important confounders.

Conclusions

The present study among junior physicians in Germany suggests that the association between depressive symptoms and workplace bullying is bi-directional. Future prospective studies are needed to improve our insights into how depressive symptoms and victimization from bullying interact across time and to determine underlying explanatory biopsychosocial pathways.

Competing interest statement

The authors have no competing interests to report.

Conflict of Interest

The authors declare that there are not conflicts of interest.

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