

RESEARCH ARTICLE

# Does the Association between Workplace Bullying and Post-Traumatic Stress Symptoms differ across Educational Groups?

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The aim of this study was to investigate whether the level of reported post-traumatic stress (PTSD) symptoms among targets of workplace bullying differ depending on their educational level. Exposure to workplace bullying was assessed by the behavioural experience method and the self-labelling method among 563 Danish employees. PTSD symptoms were assessed by the Impact of Event Scale – Revised. Educational level was measured as years of education. The results showed that workplace bullying was significantly associated with the reporting of PTSD symptoms. However, PTSD symptoms were not reported differently among those with experience of work-place bullying. Implementing bullying policies is an important step in promoting a healthy psychosocial working environment. All targets of workplace bullying would benefit from interventions aiming to reduce progression of PTSD symptoms.

**Keywords:** workplace bullying; educational level; post-traumatic stress disorder symptoms

Workplace bullying is defined as frequent and long-lasting negative acts directed at an individual, against which the individual cannot defend themselves (Einarsen, Hoel, Zapf, & Cooper, 2011). According to a recent survey on the psychosocial working environment among employees in Denmark, about 12% reported being bullied at their workplace (National Research Centre for the Working Environment, 2017). Workplace bullying is associated with psychological and physiological stress reactions, substance abuse, sickness absence, sleep problems, and suicidal ideation (Høgh, Hansen, Mikkelsen, & Persson, 2012; Høgh, Mikkelsen, & Hansen, 2011; Romeo et al., 2013). Furthermore, recent reviews have observed that individuals who reported workplace bullying may report negative affect and emotional exhaustion, symptoms of post-traumatic stress disorder (PTSD), anxiety, and depression (Gullander et al., 2014; Nielsen, Tangen, Idsoe, Matthiesen, & Mageroy, 2015; Verkuil, Atasayi, &

Molendijk, 2014). PTSD is a delayed or prolonged psychological response to a stressful situation or event characterized by exceptionally threatening or catastrophic nature and appears within weeks or months after the trauma (World Health Organization, 2016). Being diagnosed with the PTSD diagnosis requires experiencing specific numbers of avoidance/numbing, hyperarousal, and intrusion symptoms and having experienced or witnessed a traumatic event (American Psychiatric Association, 2000, 2013). However, as workplace bullying implies repeated events of mostly non-physical negative acts, workplace bullying does not meet the requirements of a PTSD diagnosis (Nielsen et al., 2015). Furthermore, workplace bullying is not considered similar to events such as experiencing death of a loved one, harsh war experiences or sexual, and physical abuse, where one experiences injury or threat towards one's or others' physical integrity (American Psychiatric Association, 2000). However, exposure to workplace bullying has been found to be associated with all three types of PTSD symptoms clusters; avoidance/numbing, hyperarousal, and intrusion, thus, the PTSD symptomology seems to capture the psychological distress that some targets of workplace bullying experience (Nielsen et al., 2015). Previous literature has suggested that Janoff-Bulman's theory on shattered assumptions explains why targets of workplace bullying experience traumatisation, even though bullying consists of non-physical events (Janoff-Bulman, 1989, 1992; Mikkelsen & Einarsen, 2002; Rodríguez-Muñoz, Moreno-Jiménez, Vergel, & Hernández, 2010;

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Walsht & Clarke, 2003). According to the theory on shattered assumptions, fundamental assumptions about oneself, others, and the world create a sense of invulnerability in our conceptual system that helps us function in our daily lives and maintain stability and coherence during the aftermath of traumatic events (Janoff-Bulman, 1989, 1992). The prolonged bullying is suggested to act as repeated traumatic events that shatter our conceptual systems and which can result in traumatisation (Nielsen et al., 2015). Therefore, it is relevant to consider that bullied individuals' psychological invulnerability shield can break down and affect their mental health.

Individuals of different socioeconomic positions seem to experience workplace bullying. Some studies have observed that bullying is more common among individuals in less powerful occupational positions, with no or lower education and with lower household incomes (National Research Center for the Working Environment, 2016; Roscigno, Lopez, & Hodson, 2009; Tsuno et al., 2015). Other studies found similar levels of reporting of workplace bullying among individuals of both low and high occupational positions (Einarsen & Raknes, 1997; Hoel, Cooper, & Faragher, 2001; Zapf, Escartín, Einarsen, Hoel, & Vartia, 2011). Furthermore, individuals who were highly educated and in managerial positions have also reported to have been bullied at their workplace (Ariza-Montes, Muniz, Leal-Rodríguez, & Leal-Millán, 2014; Salin, 2001). There is also evidence on socioeconomic differences in mortality and health outcomes (Antonovsky, 1967; Brønnum-Hansen & Baadsgaard, 2012). According to a framework on social disparities in health, individuals in more disadvantaged social groups might experience worse health consequences than more advantaged social groups because of social and biological differences in their vulnerability, in particular, because of a clustering of risk factors in the more disadvantaged groups (Diderichsen, Evans, & Whitehead, 2001). The diathesis-stress model also suggests that individuals with increased vulnerability are at higher risk of developing psychological disorders, when being exposed to stressors in their surroundings (Bladbjerg, Sandbæk, & Stallknecht, 2012). Based on these theories, the individual vulnerability in more disadvantaged social groups could contribute to some individuals experiencing mental health problems after being bullied.

Another factor influencing the effects of bullying on mental health is Sense of Coherence (SOC), a personal disposition that reflects how an individual copes with stress by virtue of one's general view on life (Antonovsky, 1987). Individuals with high SOC are considered more resilient to stress and they have a better health status and life quality than individuals with low SOC (Antonovsky, 1987; Eriksson & Lindström, 2007; Super, Verschuren, Zantinge, Wagemakers, & Picavet, 2014). High SOC has previously been observed to be protective against PTSD symptoms among individuals who were bullied occasionally, but not for targets of severe bullying (Nielsen, Matthiesen, & Einarsen, 2008; Reknes et al., 2016). In general, those exposed to bullying have been observed to use more

negative coping styles compared to those without the experience of being bullied when coping with stressful events (Reknes et al., 2016). Furthermore, individuals with lower SOC have been observed to be more prone to report workplace bullying (Francioli et al., 2016). Together, the theory on shattered assumptions, the framework on social disparities in health, the diathesis-stress model, and SOC emphasise that vulnerability is important to consider when understanding individual health consequences of workplace bullying.

While education reflects an individual's level of knowledge, it is also an indicator of occupational position and income, which is why education may have relevance when considering health outcomes (Galobardes, Shaw, Lawlor, Lynch, & Smith, 2006). An individual's educational level is suggested to be a determinant for future socioeconomic position, as it captures impacts of both early life conditions on adult health and the current impact of adult resources on adult health (Galobardes et al., 2006). Because of these links, understanding the association between education and health outcomes could help identify and address health inequalities in society (Christensen et al., 2014; Diderichsen et al., 2001; Institute of Public Health in Ireland, 2008). Understanding psychological mechanisms, i.e., whether workplace bullying has greater health effects on lower socioeconomic groups, has great public health relevance in terms of identifying vulnerable individuals that are more prone to report poor mental health and targeting health prevention initiatives to specific groups in society. Thus, investigating whether there is a social gradient in PTSD symptoms among those exposed to workplace bullying could add to the knowledge on social determinants in health and the prevention of health outcomes. PTSD burdens not only individuals affected, but also the resources of society; thus, despite not being diagnosed with PTSD, living with the PTSD symptoms for a longer time can be stressful for individuals (Atwoli, Stein, Koenen, & McLaughlin, 2015). Therefore, the aim of the present study was to investigate whether targets of workplace bullying report PTSD symptoms differently depending on their educational level. The hypothesis was that individuals with low educational level would be more prone to report PTSD symptoms compared to individuals with high educational level, when being exposed to workplace bullying. Further, to investigate whether specific PTSD symptoms clusters were reported more often compared to others as earlier found by other studies (Nielsen et al., 2015), we also investigated whether targets of workplace bullying reported avoidance/numbing, hyperarousal, and intrusion symptoms differently depending on their educational level.

## Method

### *Study Design and Participants*

This study used cross-sectional self-reported data collected in 2006 as part of the Danish Workplace Bullying and Harassment (WBH) study, which is a cohort study aimed at investigating risk factors of bullying, negative

behaviour and additional social, health and occupational consequences (Høgh et al., 2009). The method of data collection in the WBH study is described in detail elsewhere (Høgh et al., 2009). Complete data were obtained for 3,354 participants, whereof 870 participants filled out the questions on PTSD symptoms. Only participants who had experienced workplace bullying, negative acts, violence, threats, unwanted sexual attention or traumatic experiences at work were asked to respond to the questions on PTSD symptoms. Therefore, we excluded participants who reported violence, threats, unwanted sexual attention or traumatic experiences at work and only included participants reporting workplace bullying and negative acts at work ( $N = 563$ ).

### Questionnaire

#### Negative acts

Participants reported the frequency of experienced negative acts at their workplace within the past six months (response options: *Never*, *Occasionally*, *Monthly*, *Weekly*, and *Daily*). Data were collected via the behavioural experience method, where participants were presented to a list of negative acts. Twenty-one negative acts from the Negative Acts Questionnaire – Revised (NAQ-R) and two negative acts (“that all talking stops when you enter a room, where the colleagues are present” and “direct or indirect threats of being fired”) added by the research group of the WBH study were computed into one continuous negative acts scale (Cronbach’s  $\alpha = .91$ ) ranging from 0–115 points (Einarsen, Hoel, & Notelaers, 2009; Nielsen, Matthiesen, & Einarsen, 2010). Further, the scale was subdivided into a work-related negative acts scale with 10 items (10–50 points; Cronbach’s  $\alpha = .80$ ) and a person-related negative acts scale with 13 items (13–65 points; Cronbach’s  $\alpha = .87$ ) to investigate any differences in types of negative acts (Høgh et al., 2009). Thus, the negative acts variable measured the degree of bullying.

#### Self-labelled workplace bullying

Participants were asked whether they had been exposed to workplace bullying within the past six months (response options: *Never*, *Occasionally*, *Monthly*, *Weekly*, and *Daily*) preceded by a definition of workplace bullying: “Bullying takes place when one or several persons over a longer period repeatedly are exposed to unpleasant/offensive or negative acts or behaviour at their workplace, which are difficult to defend oneself against”. This method—where individuals reflect on whether they consider themselves as bullied and to which extent—is usually called the self-labelling method (Zapf et al., 2011). A dichotomised variable was created for those who labelled themselves as not being bullied representing those responding *Never*, while those who labelled themselves as being bullied included the responses *Occasionally*, *Monthly*, *Weekly*, and *Daily*. Thus, the self-labelled workplace bullying variable measured bullied compared to non-bullied. As workplace bullying can be measured by negative acts at the workplace as well as self-labelled workplace bullying, both measures were included in this study.

#### PTSD symptoms

Only participants who had been exposed to bullying, negative acts, violence, threats, unwanted sexual attention or other traumatic experiences at work were asked to report whether they had experienced different reactions, i.e. PTSD symptoms, the past seven days and to what degree. All participants who experienced any other stressful events at work other than bullying and negative acts at work, were excluded from the analyses. Furthermore, participants who did not respond to any of the questions on PTSD symptoms were also excluded. PTSD symptoms were measured by the Impact of Event Scale – Revised (IES-R), which assesses the impact of events and the consequent reactions that participants experience following traumatic events (Weiss & Marmar, 1997). There were five response options for the PTSD symptoms variable: *Not at all*, *To a less degree*, *To some degree*, *To a high degree*, and *To the highest degree*. One overall PTSD scale was computed including all 22 PTSD items (0–110 points; Cronbach’s  $\alpha = .95$ ). PTSD mean scores were calculated for the participants and will be defined as PTSD symptoms in the following.

To perform exploratory analyses and investigate potential differences between the three main PTSD symptoms clusters (Christianson & Marren, 2012; Rash, Coffey, Baschnagel, Drobles, & Saladin, 2008), the overall scale was divided into three symptoms clusters scales; avoidance/numbing with eight items (0–40 points; Cronbach’s  $\alpha = .88$ ), hyperarousal with six items (0–30 points; Cronbach’s  $\alpha = .90$ ) and intrusion with eight items (0–40 points; Cronbach’s  $\alpha = .93$ ).

#### Educational level

Educational level was assessed by using three educational categories representing the participants’ vocational education levels: Low educational level (*Less than 3 years of vocational education*), Medium educational level (*3–4 years of vocational education*), and High educational level (*More than 4 years of vocational education*). Educational level was measured as an ordinal measure in line with applied methods in the literature, where the categories of economic status is ordered from low, medium to high (Christensen et al., 2014).

#### Covariates

Information on age and gender was obtained from the participants’ central personal registration number. The age of the participants was categorized into 10-years intervals; 19–29, 30–39, 40–49, 50–59 and 60 years and above.

SOC was included as a personality disposition measure to investigate whether the association between workplace bullying and PTSD symptoms changed when adjusting for SOC. Nine questions measured the participants’ SOC score, where participants reported on how they perceived themselves by choosing how well different statements applied to them (response options: *Applies precisely*, *Applies quite well*, *Applies fairly*, *Applies a little*, and *Does not apply*). The nine items were computed into a SOC scale (0–100 points), and the higher the score, the stronger the

SOC. The SOC of the study population was described as low or high according to the median (80.56) of the SOC scale (Sairenchi et al., 2011), since there is no official SOC threshold that defines a low or high SOC.

### Statistical Methods

Descriptive frequency statistics were performed to observe any differences in the reported PTSD symptoms across educational levels in participants reporting any or no negative acts at the workplace and in participants reporting being bullied or not bullied. Analysis of Variance (ANOVA) tests were applied to compare the means of PTSD symptoms between groups.

To investigate whether workplace bullying (negative acts and self-labelled bullying) and PTSD symptoms were associated, crude general linear regression analyses were performed with the two workplace bullying variables as exposures and PTSD symptoms as the outcome variable. To study whether PTSD symptoms were reported to a higher degree when experiencing negative acts at work compared to self-labelled workplace bullying, the two exposure variables were investigated in separate analyses.

General linear regression was applied to determine whether the PTSD symptoms of the different educational groups differed significantly when being exposed to workplace bullying. Multiplicative interactions variables were included as educational level multiplied with the

negative acts variable and the self-labelled bullying variable respectively. The PTSD symptoms variable was included as the outcome variable and age, gender, and SOC were included as covariates. General linear regression was also applied in exploratory analyses, which investigated whether there were differences in main PTSD symptoms clusters reported among those exposed to workplace bullying.

A 5% statistical significance level was applied in all analyses and all analyses were performed using the statistical program IBM SPSS Statistics 23.

### Results

The majority of the included participants in this study were female (64.8%) and the participants had an average age of 45 years (range: 19–69 years). In the sample, 49.2% had a low educational level, 33.2% had a medium educational level and 17.6% had a high educational level. Participants in all educational groups had significantly more PTSD symptoms when experiencing negative acts at work compared to participants who did not experience any negative acts (**Table 1**). However, the observed PTSD symptoms were not significantly different across educational levels ( $p = .996$ ).

Participants in all educational groups who labelled themselves as being bullied at work had significantly more PTSD symptoms than those not labelling themselves as bullied (**Table 2**). As also observed in **Table 1**, the

**Table 1:** Reported post-traumatic stress (PTSD) symptoms across educational levels in participants reporting any or no negative acts at the workplace (N = 563).

	Negative acts at the workplace					
	Any			None		
	<i>n (%)</i>	<i>PTSD symptoms (95% CI)</i>	<i>SOC mean score</i>	<i>n (%)</i>	<i>PTSD symptoms (95% CI)</i>	<i>SOC mean score</i>
<b>Low educational level</b>						
All	230 (83)	17.26* (14.90; 19.62)	76.82	47 (17)	4.86 (2.40; 7.32)	80.53
Gender						
Women	126 (55)	20.28 (16.86; 23.70)		29 (62)	5.38 (1.73; 9.02)	
Men	104 (45)	13.60 (10.51; 16.68)		18 (38)	4.03 (0.98; 7.07)	
<b>Medium educational level</b>						
All	162 (87)	17.33* (14.49; 20.17)	80.26	25 (13)	7.65 (1.14 – 14.16)	83.44
Gender						
Women	121 (75)	18.50 (15.15; 21.85)		20 (80)	8.48 (0.43; 16.53)	
Men	41 (25)	13.87 (8.44; 19.31)		5 (20)	4.32 (-6.17; 14.80)	
<b>High educational level</b>						
All	91 (92)	17.12* (13.59; 20.65)	82.19	8 (8)	1.42 (-0.78; 3.62)	87.15
Gender						
Women	50 (55)	20.34 (14.85; 25.83)		2 (25)	2.84 (-33.26; 38.94)	
Men	41 (45)	13.20 (9.19; 17.22)		6 (75)	1.42 (-1.49; 3.38)	

*Note.* \*Analysis of Variance test comparing post-traumatic stress (PTSD) symptoms across educational levels when reporting negative acts:  $F(2,480) = 0$ ,  $p = 0.996$ .

**Table 2:** Reported post-traumatic stress (PTSD) symptoms across educational levels in participants reporting being bullied and not bullied at the workplace (N = 552).

	Self-labelled workplace bullying					
	Yes			No		
	<i>n (%)</i>	<i>PTSD symptoms (95% CI)</i>	<i>SOC mean score</i>	<i>n (%)</i>	<i>PTSD symptoms (95% CI)</i>	<i>SOC mean score</i>
<b>Low educational level</b>						
All	87 (32)	24.51* (20.43; 28.57)	71.63	185 (68)	10.52 (8.37; 12.67)	80.08
Gender						
Women	44 (51)	30.39 (24.35; 36.43)		109 (59)	11.88 (8.93; 14.83)	
Men	43 (49)	18.47 (13.43; 23.51)		76 (41)	8.57 (5.46; 11.67)	
<b>Medium educational level</b>						
All	44 (24)	28.55* (22.40; 34.70)	78.35	139 (76)	12.08 (9.42; 14.74)	81.53
Gender						
Women	33 (75)	29.41 (22.47; 36.36)		105 (76)	13.20 (9.95; 16.45)	
Men	11 (25)	25.96 (10.64; 41.27)		34 (24)	8.63 (4.39; 12.86)	
<b>High educational level</b>						
All	28 (29)	29.88* (22.25; 35.52)	80.95	69 (71)	10.96 (7.63; 14.29)	83.31
Gender						
Women	18 (64)	33.44 (24.15; 42.73)		34 (49)	12.37 (7.03; 17.71)	
Men	10 (36)	20.68 (13.41; 27.95)		35 (51)	9.59 (5.34; 13.84)	

Note. \*Analysis of Variance test comparing post-traumatic stress (PTSD) symptoms across educational levels when reporting bullying:  $F(2,156) = 0.95, p = .390$ .

**Table 3:** Post-traumatic stress (PTSD) symptoms among participants reporting negative acts and bullying at the workplace.

<i>Exposure</i>	<i>PTSD symptoms</i>		
	<i>β*</i>	<i>95% CI</i>	<i>p-value**</i>
Work-related negative acts	0.84	0.72; 0.95	$p < .001$
Person-related negative acts	1.00	0.88; 1.13	$p < .001$
Self-labelled bullying	15.24	12.24; 18.25	$p < .001$

Note. \*β represents the slope in post-traumatic stress (PTSD) symptoms for every unit increase/decrease in work – and person-related negative acts. For self-labelled bullying, the β represents the difference in PTSD symptoms between bullied and non-bullied. \*\*Analysis of Variance test comparing PTSD symptoms in the groups reporting work-related negative acts, person-related negative acts and bullying respectively.

reported PTSD symptoms among participants labelling themselves as bullied were not significantly different across educational levels ( $p = .390$ ).

Work-related negative acts, person-related negative acts and self-labelled bullying were all significantly associated with reporting PTSD symptoms (Table 3). The more work-related negative acts reported by the participants, the more PTSD symptoms were reported ( $\beta = 0.84, t(562) = 13.78, p < .001$ ). This same pattern was observed in the association between person-related negative acts and PTSD symptoms ( $\beta = 1.00, t(562) = 16.02, p < .001$ ). Participants who labelled themselves as being bullied had significantly more PTSD symptoms than those who did

not label themselves as being bullied ( $\beta = 15.23, t(562) = 9.96, p < .001$ ).

Table 4 presents the analyses of our research question investigating differences in PTSD symptoms among participants with low, medium and high educational level exposed to workplace bullying. The analyses showed that participants with low educational level did not report significantly more PTSD symptoms than others with medium or high educational levels when experiencing work-related negative acts ( $p = .192$ ). Participants with low educational level did not report more PTSD symptoms than those with the other two educational levels when experiencing person-related negative acts either ( $p = .444$ ).

**Table 4:** Post-traumatic stress (PTSD) symptoms among educational groups reporting negative acts and bullying at the workplace. Adjusted for gender, age and Sense of Coherence.

<i>Exposure</i>	<i>Educational level</i>	<b>PTSD symptoms</b>			
		$\beta^*$	$\beta$ difference**	95% CI	<i>p</i> -value***
Work-related negative acts	Low	0.72	-.24	-0.59; .12	<i>p</i> = .192
	Medium	0.82	-.14	-0.53; .25	<i>p</i> = .477
	High	0.96	0	-	-
Person-related negative acts	Low	0.87	-.13	-.47; .21	<i>p</i> = .444
	Medium	1.13	.13	-.27; 0.52	<i>p</i> = 0.536
	High	1.01	0	-	-
Self-labelled bullying	Low	-	-4.97	-12.96; 3.02	<i>p</i> = .222
	Medium	-	-1.42	-10.09; 7.25	<i>p</i> = 0.748
	High	-	0	-	-

*Note.*  $\beta$  represents the slope in post-traumatic stress (PTSD) symptoms for every unit increase/decrease in work- and person-related negative acts. For self-labelled bullying, the  $\beta$  represents the difference in PTSD symptoms between bullied and non-bullied. \*\* $\beta$  difference represents the differences in PTSD symptoms between low and high educational level. \*\*\**p*-value represents the probability of finding no  $\beta$  differences in PTSD symptoms between low and high educational level.

No differences in reported PTSD symptoms were observed across educational levels for participants with low educational level who labelled themselves as being bullied ( $p = .222$ ). According to the results in **Table 4**, there were no significant differences in reported PTSD symptoms across educational levels when experiencing any kind of workplace bullying, therefore, PTSD symptoms did not seem to be reported differently across educational levels, when being exposed to workplace bullying.

The exploratory analyses showed no significant differences in the reporting of different types of PTSD symptoms (avoidance/numbing, hyperarousal, and intrusion) for any educational group, when being exposed to workplace bullying.

## Discussion

The statistically significant results showing that there is an association between being bullied and experiencing PTSD symptoms are consistent with the existing literature (Nielsen et al., 2015). However, we did not find any significant differences in reported PTSD symptoms between educational groups. Likewise, we did not find any indication that the association between bullying and PTSD symptoms depended on educational level. Thus, the hypothesis that participants with an experience of bullying who had had less than 3 years of vocational education would be more vulnerable and, thereby, more prone to report PTSD symptoms, was not supported. Workplace bullying seems to be a stressor regardless of educational level. This was also observed in another study which found that there was no social gradient in terms of workplace bullying (Niedhammer, Chastang, David, & Kelleher, 2008). In terms of planning public health interventions, the results of this study suggest that broader initiatives against workplace bullying, regardless of

educational level of the staff, would be more applicable to prevent or reduce the distress associated with workplace bullying.

Some individuals have reported that they developed greater resilience and had a feeling of being in control after being bullied (van Heugten, 2012). Nurses have also shown to develop a stronger personal resilience and reduced vulnerability to continue being productive in the health-care setting (Jackson, Firtko, & Edenborough, 2007). As having a high SOC reflects resilience to stress (Antonovsky, 1987), we would expect that participants with a high SOC score would have lower PTSD symptoms scores. In our study, participants reporting PTSD symptoms had SOC scores above 70, which could be considered as a relatively high SOC compared to SOC findings in other studies (Ahola et al., 2010; Sairenchi et al., 2011). However, due to lack of comparison with those who did not experience bullying and no approved SOC threshold, we cannot determine whether the participants in our study had a low or high SOC. It could be argued that those reporting workplace bullying feel resilient and able to work despite experiencing PTSD symptoms.

As the workplaces registered themselves to participate in this study (Hogh et al., 2009), it might have introduced some bias in participants reporting bullying or its effects. However, as earlier stated, the recent workplace bullying prevalence in Denmark was observed to be about 12% in 2012, 2014 and 2016 (National Research Centre for the Working Environment, 2017), which corresponds to the overall workplace bullying prevalence of 10.6% observed in our overall study population of 2006. Thus, considering the distribution of workplace bullying, the workplaces in the current study appear to be representative of Danish workplaces in general. Furthermore, we compared the participants' vocational education levels with vocational

education levels in the Danish population among 20–69 year old individuals extracted from Statistics Denmark (Statistics Denmark, 2016). Compared with the Danish population, the participants in our study population were less likely to have a low educational level of 49% vs. 60%, more likely to have a medium educational level of 33% vs. 27% and high educational level of 18% vs. 13%.

An important limitation that should be taken into account is that we might lack sufficient power in our main analyses, as only 563 participants were eligible for our analyses. We further categorised our study population into educational groups, gender and groups of those reporting bullying or negative acts and no bullying or negative acts. However, from the descriptive results, it is observed that all educational groups who reported negative acts at work had more PTSD symptoms compared to those reporting no negative acts (**Table 1**). All educational groups who reported bullying also had more PTSD symptoms compared to those not reporting bullying (**Table 2**). Therefore, the power for the main analyses, in which we categorised our participants further, may have been too low to show significant differences.

### Conclusions

Contrary to what we expected from our hypothesis, we found that those who had experienced workplace bullying did not report PTSD symptoms differently across educational levels. Employees with low educational level were not more likely to report the effects of workplace bullying compared to employees with medium or high educational level. However, there are some implications for future research that should be considered. Knowledge of other traumatic life events in individuals' lives is important to be able to adjust for confounding effects when investigating the relationship between workplace bullying and PTSD symptoms. Likewise, longitudinal studies are necessary to study causal associations between workplace bullying and development of PTSD symptoms across educational levels. Furthermore, it is important to bear in mind that it is difficult to explain social disparities in health, since many cultural and demographic factors must be taken into consideration in a multilevel approach to understand specific health outcomes (Chen & Miller, 2013). To our knowledge, this article is the first to investigate whether PTSD symptoms are reported differently among those exposed to workplace bullying. Thus, this article contributes to the knowledge on social determinants of mental health as a tool for research and prevention in a public health perspective (World Health Organization and Calouste Gulbenkian Foundation, 2014).

### Competing Interests

The authors have no competing interests to declare.

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**How to cite this article:** Islamaska, S., Grynderup, M. B., Nabe-Nielsen, K., Høgh, A. and Hansen, Å. M. (2018). Does the Association between Workplace Bullying and Post-Traumatic Stress Symptoms differ across Educational Groups? *Journal of European Psychology Students*, 9(1), 1–9, DOI: <https://doi.org/10.5334/jeps.432>

**Published:** 17 January 2018

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