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LARS HØJSGAARD ANDERSEN

THERESE BAY-SMIDT CHRISTENSEN

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Address:
The ROCKWOOL Foundation Research Unit
Ny Kongensgade 6
1472 Copenhagen, Denmark

Telephone +45 33 34 48 00
E-mail: kontakt@rff.dk
https://www.rockwoolfonden.dk/en

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Prevalence and Consequences of Violence on the Job Hit Females in Healthcare Provision Hard

Lars Højsgaard Andersen[1*] and Therese Bay-Smidt Christensen[1]

ABSTRACT

Background: Millions of employees worldwide are exposed to violence while performing their job. Risks are notoriously high in specific sectors, such as healthcare provision, and consequences are alarming. Methodological challenges limit existing research, however.

Methods: Combining survey data and register data from Denmark provided a chance to estimate the prevalence of work-related violent victimisation and its consequences for sick leave – an indicative measure of serious health issues exceeding 30 days. Register data allowed for analyses of trajectories of sick leave by exposure to workplace violence. Separate analyses were conducted by sector, sex, and by sex within sectors.

Findings: On average, 10% of employed Danes were exposed to workplace violence over the course of a year. Females had twice the risk of males, which was to some degree caused by gendered employment patterns across sectors. Within healthcare provision, rates were 34% (females) and 25% (males). Association with sick leave was strong, although heterogenous across sex and work sectors.

Interpretation: Although previous research may have overstated the consequences of work-related violent victimisation because of methodological issues, results from our study also showed that work-related violence is a serious public health issue that requires attention. The need for attention is especially strong in healthcare provision, as females here have exorbitantly high rates of exposure and suffer substantial consequences of victimisation for sick leave. Individual level consequences may be smaller than previous estimates imply, yet the consequences still cumulate into profound costs at the public health level.

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[1] ROCKWOOL Foundation Research Unit
[*] Please direct correspondences to Lars H. Andersen, ROCKWOOL Foundation Research Unit, Ny Kongensgade 6, DK-1472 Copenhagen K, phone: (+45) 66 66 63 78, email: lha@rff.dk.

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INTRODUCTION

Every day, people who deliver services to clients are at risk of being exposed to aggressive behaviour and/or violence while performing the core tasks of their job. In the United States alone, almost 2 million Americans report the victimisation of workplace violence each year, and many additional cases likely go unreported.[1] Health care providers constitute a group at particularly high risk throughout the world. For example, 47% and 76% of healthcare personnel in Brazil and Bulgaria were victims of verbal abuse and/or physical assault within the previous year, and between 8% and 38% of health workers are exposed to physical violence at some point during their career.[2]

Being exposed to violence is associated with a range of negative consequences. Between 40% and 70% of survey participants who reported victimisation in surveys carried out by the WHO and other organisations also reported experiencing PTSD symptoms, and victims tend to have higher rates of sick leave from work than non-victims.[2–5] Exposure to violence is also associated with other important outcomes, which means that exposure to violence on the job is a serious risk factor not only for health but for wellbeing broadly defined.[6–11]

But alarmingly high as the just mentioned exposure risks and consequences are, existing research suffers from data limitations that impair the precision of these estimates. Most data sources only allow researchers to focus on indicators of health and wellbeing after violence took place (one notable exception also used data from Denmark and found an association

between physical victimisation and both short- and long-term sick leave[4]). Therefore, one core source of unobserved heterogeneity – preexisting indicators of health and wellbeing – is typically not sufficiently controlled for. This formulation is not meant to claim that some people, who also have poor health and lower wellbeing, actively seek out victimisation. What we refer to is simply the insight from criminological research that victimisation is nonrandomly distributed and could be associated with a range of variables that are likely to be unobserved in the data, such as the types of encounters professionals have with clients.[12,13]

Workplace violent victimisation is thus a deeply acknowledged yet still understudied public health issue.[12] In the study behind this paper, we merged several individual level datasets to provide new knowledge on the consequences of workplace violent victimisation, both for healthcare providers and for other sectors, and with special emphasis on sex. Specifically, we used data from three waves of national surveys of work environments in Denmark which included questions related to exposure to physical violence and violent threats. To overcome unobserved heterogeneity issues, we merged the survey data with population register data. The linked administrative nature of these data allowed us to not only control for a range of background characteristics but also to construct a panel structure by measuring individual level sick leave both prior to and following the surveys. Our measure of sick leave was thus obtained from official registers and was administratively defined and less vulnerable to biases that may arise when using self-reported measures. Results presented in this paper thereby offer new knowledge on the prevalence of workplace victimisation and how victimisation is associated with sick leave by sex and work sectors.

METHODS

Study entities

In this panel study we merged survey data and Danish administrative data to estimate the prevalence and consequences of work-related violent victimisation in Denmark. The study entities were chosen among participants from three rounds (2012, 2014, and 2016) of "The Work Environment and Health" survey, which was run by Statistics Denmark on behalf of The Danish National Research Center for the Working Environment. The Danish National Research Center for the Working Environment kindly provided us with access to the survey data, yet the authors behind this study conducted and bear responsibility for all analyses and interpretations of results presented in this paper. The survey questionnaire was sent to a random sample of Danish wage earners in the age range 18-64 years. In total, 167,422 persons where invited to participate and the average response rate was 53.9%. Along with the data, statistical weights were delivered to make the survey data representative of the population in terms of sex, age, and type of job.[i] As study entities, we used persons who answered the following two survey questions: *"Have you within the past 12 months been exposed to physical violence in your workplace*?" and *"Have you within the past 12 months been exposed to threats of physical violence in your workplace?"*. Item non-response to these two questions reduced the sample by 8,187 respondents (app. 9.1%). Furthermore, we focused only on persons aged 18-62 years to avoid our follow up period being conflated with retirement (usually at age 65). The final sample included 77,388 respondents. All data were processed in line with the 2018 Danish Data Protection Act and the 2016 General Data Protection Regulation (GDRP) of the European Union.

[i] We applied the statistical weights when estimating bivariate associations, such as the victimisation prevalence and when plotting sick leave before and after the interview period. We did not apply the weights in our more elaborate statistical models (difference-in-differences models) because methodological research has shown that weights may behave counterintuitively in multivariate analyses.[19]

Variables

One benefit of Statistics Denmark having conducted the survey was that they included encrypted personal identification numbers for each recipient of the survey. This enabled us to merge the survey data to administrative data sources also hosted by Statistics Denmark under the Law of Statistics Denmark, effectively providing access to outcomes and background information not covered by the survey.[14]

As independent variable, we defined people who answered in affirmative to either or both survey questions mentioned above as "victims of work-related violent victimisation" (1 = Yes, 0 = No). The survey also contained questions related to the frequency of victimisation, yet because of low variation in frequency, we opted to focus on the binary definition. Among the perpetrators, 93% were costumers, clients, patients, or students, and the rest were predominantly colleagues.

As our outcome variable, we measured the reception of sick leave benefits. We obtained this information from the DREAM register which recorded, for each week of the year, the main type of social benefits (if any) each of the citizens of Denmark received. The DREAM register is based on information from the Danish Ministry of Employment, the Danish Ministry of Education, and the Danish Customs and Tax Administration. Eligibility for sick leave benefit is achieved following a medical report from a general practitioner and absence from work for at least 30 days and one sick leave period cannot exceed 22 consecutive weeks.[15] As was already mentioned, because we link survey respondents to administrative records we could measure each respondent's dependency on sick leave benefits both before and after the survey was carried out, effectively allowing us to analyse average trajectories of sick leave benefits and whether and how these are associated with victimisation. We did not have information of the exact date when

each respondent completed the survey, wherefore we defined the "interview period" as a six-quarters window within which each of the survey rounds could possibly have been conducted. We excluded these interview periods from our statistical model. This was in order to safely separate a period prior to the interview period and a period after, to ensure that the timing of sick leave and victimisation could not be reversed. For our graphical representation of trajectories of sick leave, we aggregated our measure of sick leave to indicate whether (1 = Yes, 0 = No) each respondent had received any sick leave benefits during each calendar quarter from eight quarters before to eight quarters after the interview period. When estimating the association between victimisation and changes to sick leave, however, we used the weekly sick leave information to calculate the proportion of the full two years prior to and following the interview period that respondents received sick leave benefits (i.e. number of weeks on sick leave divided by 104 weeks; this was done separately prior to and following the interview period).

As possible confounders we took age, interview year, ethnic minority background, parenthood, and marital status into account. We obtained these variables from the linked administrative data. Age was measured on January 1st of the interview year. Work sector was defined based on the International Labour Organization's (ILO) International Standard Classification of Occupations. We aggregated occupations into "healthcare provision" (doctors, nurses, care providers in the health sector), "other high risk sectors" (police, prison staff, security personnel, social workers, and teachers and pedagogues), and "low risk sectors" (all other occupations). Ethnic minority background was obtained from the population register and measured whether each respondent or his or her parents had migrated to Denmark from a non-Western country. Marital status and parenthood were also obtained from the population register

and measured, respectively, whether respondents were married, cohabiting, or single, and whether they had any children.

Study design and statistical analysis

The prevalence of work-related violent victimisation – overall and by gender and sector – was estimated from the self-reports in the Work Environment and Health survey. We pooled the data from all three survey years. To analyse the association between victimisation and trajectories of sick leave, we plotted the proportion that received sick leave benefits before and after the interview periods. To measure the strength of the association between victimisation and sick leave, taking confounders and, importantly, prior sick leave into account, we estimated whether the change in sick leave from before to after the interview period was substantially and statistically greater for respondents who reported violent victimisation than for respondents who did not report suffering this experience. Formally, we used a difference-in-differences model, which we estimated using OLS. The difference-in-differences model belongs to the class of quasi-experimental research designs that aims to study causal relationships in settings where randomised controlled trials would be unethical or hard to implement, such as in the setting of workplace violence.[16] One major strength of this model is that it, by comparing the situation after the interview to before for everyone in the data, took prior differences in sick leave as well as unobserved individual characteristics that were stable across time into account. The fundamental assumption of the model is that the average change in sick leave from before to after the interview period for respondents who did not report exposure to workplace violence mirrored what the average change would have been for respondents who reported exposure – if they had instead not been exposed (the parallel trends assumption). The model could not, however, take unobserved individual traits into account if these varied over time, just as the model is

fundamentally associational because we do not have experimental variation in exposure to workplace violence.[16] To fully account for differences across sex and work sector, we also applied the model by sex and sector. All analyses were conducted with a significance level of 95%.

Role of the funding source

The funder of this study had no role in the study design, data collection, analysis, or the dissemination of results. The authors both had access to all the data, both the survey data and the administrative data, and the authors bear responsibility for the analyses, results, and interpretations of results. The corresponding author was responsible for the decision to submit for publication.

RESULTS

Table 1 describes our sample, split by interview round, relates it to the population of 18-62 year old employed people in Denmark (the population), and shows the results from comparing respondents who reported exposure to work-related violent victimisation in the surveys and respondents who did not. Although survey respondents on average were older than the population across all three interview years, they resembled the population well on the other covariates.

[Insert Table 1 about here]

Prevalence estimates

Figure 1 shows our estimates of the prevalence of work-related violent victimisation and reports the overall prevalence as well as estimates by sector. Overall, 10.48% reported exposure to

violent victimisation (5.83% physical violence, 8.69% threats, 4.03% both physical violence and threats). This estimate, however, covered great variability across sectors. Whereas less than 5 percent in the low risk sector were exposed, the same was true for almost one out of three in healthcare provision and one in four in the other high risk sector. Alarmingly high as these prevalence estimates are, they still dwarf those reported in existing research. The reason for this could simply be that the prevalence is lower in Denmark than in other countries. The rate of serious assault in Denmark in 2017 was, for example, only around 33 per 100,000, which is dramatically lower than reported for, for instance, the England and Wales (880 per 100,000) and the United States (250 per 100,000).[17]

[Insert Figure 1 about here]

Figure 2 shows prevalence estimates by sex and by sex within sectors. The prevalence was almost twice as high for females as for males. This result, however, may to some degree be explained by sector differences in where females and males tend to be employed. Thus, the prevalence of work-related violent victimisation was high for both males and females in healthcare provision and in other high risk sectors, and likewise low for both males and females in low risk sectors. The estimated prevalence among females working with healthcare provision was, however, notably high. Around one in three reported victimisation within the preceding year; the corresponding number for males in healthcare was one in four. This difference was not driven by differences in the ratio of threats-to-physical violence, females were just exposed at a higher rate. The sex difference in exposure within other high risk occupations was driven by males being exposed more often to threats; it was not driven by a difference in physical violence risks.

[Insert Figure 2 about here]

Association between victimisation and sick leave

Figure 3 shows average trajectories of sick leave by quarter before and after the interview period and by exposure to work-related violent victimisation. After the interview period, a substantial difference arose between those who reported exposure and those who reported no exposure. The exposure group had around 1.4 percentage points higher average sick leave. Relative to the rate of 2.3% among the non-exposed, this rate equals around +65%. This substantial difference is consistent with existing estimates. Yet focusing on the period before the interview, our criticism of existing estimates receives support: Already prior to victimisation we observed a difference in sick leave. Here, the rate of sick leave was higher among respondents who would at a later point become victimized, which we interpret to imply that victimisation is non-random and could be associated with, for examples, types of encounters with patients or clients. The upward trend in sick leave for the group that was not exposed to work-related violent victimisation was the result of a general upward trend in Denmark over the data period (see Figure A1 and an official governmental report [in Danish][18]).

[Insert Figure 3 about here]

Figure 4 shows the results from our statistical model of the association between trajectories of sick leave and work-related violent victimisation, overall as well as by sex and sector. Because the statistical model focused on differences in average individual change between respondents who were exposed and respondents who were not exposed, estimates reported in Figure 4 took into account both pre-existing differences in sick leave, the general upward trend in sick leave, and the impact of possible confounders (including time-stable individual confounders that were unobserved in the data). Appendix Table A1 reports parameter estimates for the full model.

[Insert Figure 4 about here]

The overall association between victimisation and sick leave was both statistically and substantially important, and the point estimate and 95% confidence interval suggested that sick leave increased by 0.8 percentage points, corresponding to a relative increase of +36% (which may be compared to +65% in the model that did not take pre-existing differences into account; an app. 47% reduction of the association). Taking pre-existing differences into account was thus profoundly important.

Results by sector and sex showed that the association was statistically significant across all sectors and across sex. In healthcare provision, the association was stronger than in the other sectors, with the point estimate for healthcare provision being almost twice as high as in the other sectors (confidence intervals overlapped, however). For males and females, the association was quite similar. Yet further breaking down the results by sex and sector simultaneously documented substantial differences: For females, almost the full association between sick leave and victimisation was driven by a strong association in healthcare provision. For males, we only observed a significant association in the low risk sector. Considering the high prevalence of victimisation among females working in healthcare provision (and the low victimisation prevalence for males in low risk sectors), we interpret these results as implying that victimisation and the associated costs predominantly is a key challenge for females in healthcare provision. The estimated change in sick leave that, according to our model, may be referred to victimisation was about twice the overall average across all sectors and across sex, implying a strong association.

DISCUSSION

We found substantial consequences of exposure to violence at work. Sick leave increased more, by a substantial margin, from before victimisation to after for employees who reported exposure to victimisation relative to employees who did not. On average, 10.48% of the Danish workforce were exposed to physical violence and/or threats within a year, an experience that was associated with a relative increase of +65% in sick leave over the following two years. Carefully taking pre-existing differences in sick leave into account, however, decreased the association to +36%, which underlines how post-exposure comparison alone may be biased. The prevalence varied across sectors and sex, and was almost twice as high for females as for males, but this finding was largely caused by gendered employment patterns. Healthcare providers had the highest exposure to violent victimisation. Police, security personnel, social workers, etc. had the second highest exposure rate, whereas employees in other and more low-risk sectors (which are the sectors with by far the most employees) had comparatively low exposure. The full association between victimisation and sick leave for females was driven by a very strong association for females in healthcare provision. For males, we only detected a substantial association in the low-risk sectors, yet this was from a very low rate of exposure to workplace violence.

Our results direct attention specifically to the health consequences of work-related violent victimisation for females working in healthcare. These females are exposed to a disproportionately high rate of violence and threats, and they are the main ones suffering the consequences. Victimisation affects many workplaces in important ways, of course. But victimisation and its consequences for health is, according to our study, most pronounced for female healthcare providers.

As violence in the workplace affects millions of people worldwide, results presented in this paper add to the scope of this social and public health problem. The reason for

this is that although results from our study suggested a somewhat smaller magnitude of the association between violent victimisation and one indicator of adverse health, our uniquely suited data and analytical setup (which controlled extensively for pre-existing health) ameliorated important deficiencies of existing research. Still documenting a substantial association between exposure to violence on the job and sick leave even within our more rigid research setup only bolsters the claim that workplace violence is severely consequential.

It is important to note that even for females in healthcare, the rate of sick leave is not exorbitantly high, especially when thinking about the high rate of exposure to violence. This group on average received sick leave benefits for 4.4% of the weeks during the two-year follow up period. This number was much higher than among non-exposed, yet it still shows that by far most of employees who are exposed to violence on the job manage to cope with it. Yet even though they do so without long periods of sick leave, the consequences may still accumulate into substantial costs at the societal level: There are, after all, around 200,000 females working in healthcare provision in Denmark and one in three of them are exposed to violence on the job, as our study has shown. In 2018, the Danish state paid out DKK 4,300 (~EUR 575) per week of sick leave. The sick leave related consequences of workplace violence among females in healthcare therefore amount at least to DKK 417 million (~EUR 55 million) over two years.[ii] Foregone income, productivity loss, treatment costs, and possible dynamic effects of victimisation – such as long-term issues related to PTSD symptoms – should be added to this amount, implying that the total costs of exposure to violence on the job are likely immense.

[ii] This estimate was obtained as 1/3 exposed × 200,000 females in healthcare × +0.014 percent of weeks on sick leave × 104 weeks (follow up period) × DKK 4,300 per week = DKK 417,387,000 million (~EUR 55,652,000).

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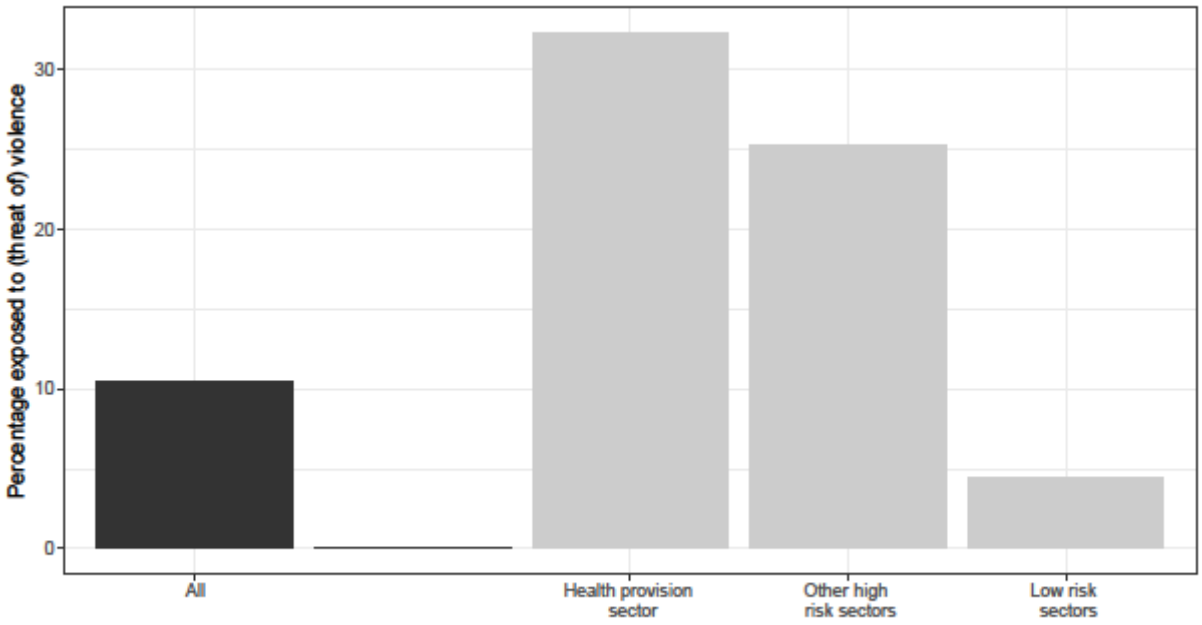
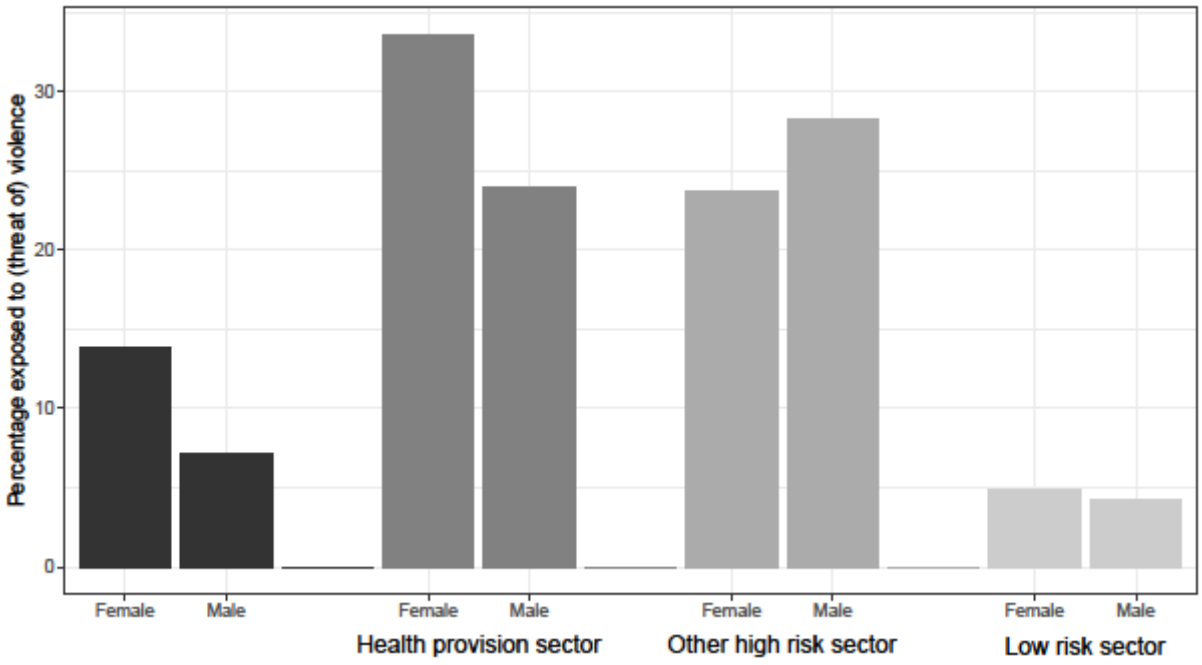
Figure 1. Percentage exposed to (threat of) violence, all and by occupation



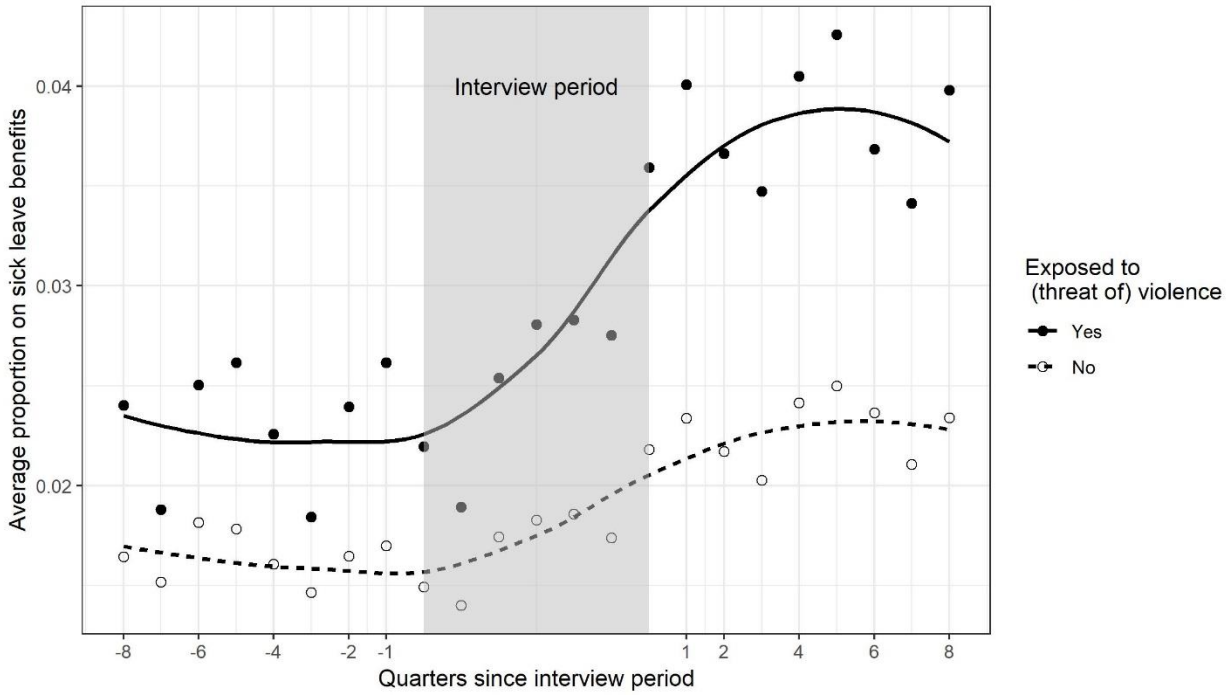
Note: The figure shows the percentage of the pooled (and weighted) survey data who reported exposure to workplace violence within the previous 12 months, overall and by work sector.

Figure 2. Percentage exposed to (threat of) violence, by sex and occupation



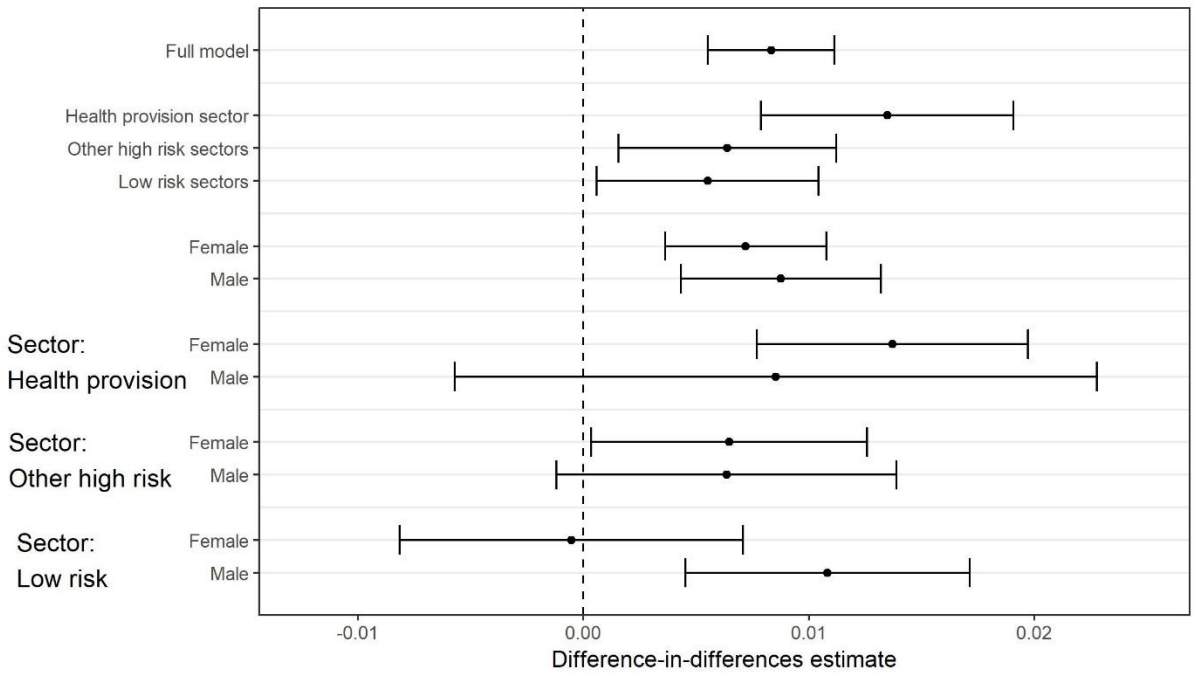
Note: The figure shows the percentage of the pooled (and weighted) survey data who reported exposure to workplace violence within the previous 12 months, by gender and work sector.

Figure 3. Proportion on sick leave benefits by quarter and by exposure to (threat of) violence



Note: The figure shows the proportion who received sick leave benefits by quarter from eight quarters (2 years) before to eight quarters (2 years) after the interview period, by exposure to (threat of) violence on the workplace. Pooled (and weighted) data from all survey rounds.

Figure 4. Association between exposure to (threat of) violence and proportion of weeks on sick leave benefits. Results from difference-in-differences models.



Note: The figure shows the additional change (and 95% confidence intervals) in average sick leave from before to after the survey period for victims of work-related violence relative to non-victims, for the full sample as well as split by sector and sex.

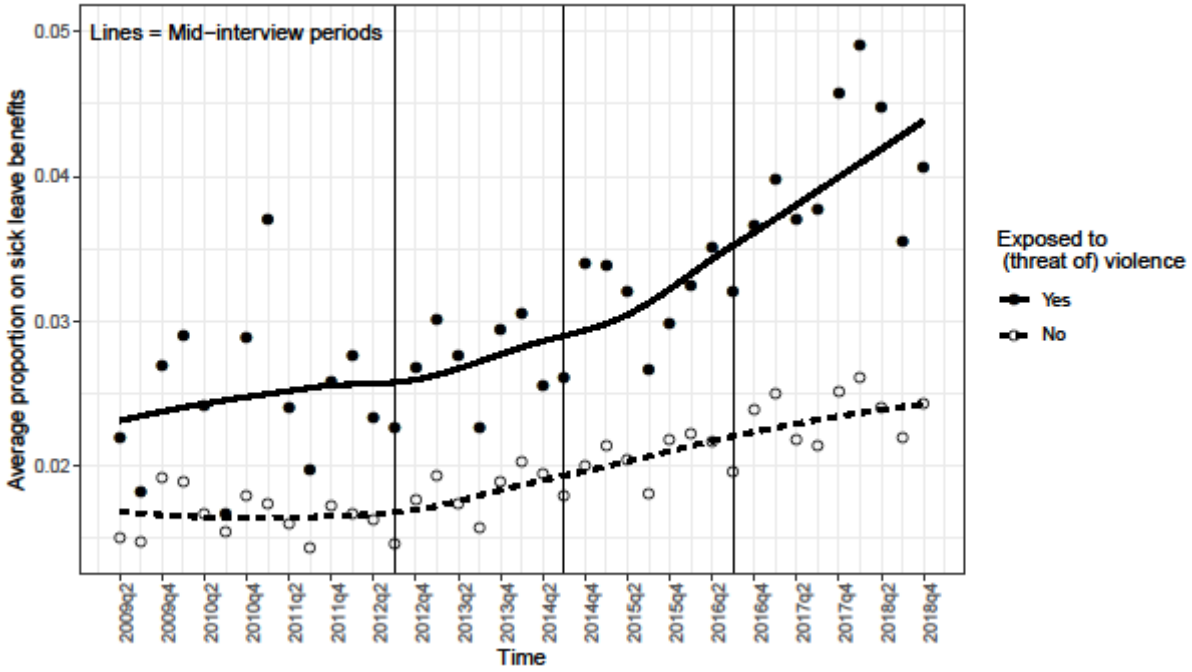
Table 1. Means and standard deviations of background variables of the population and survey respondents, by survey round and split by exposure to (threats of) workplace violence.

Covariates	Population	Survey	Exposed to workplace violence and/or threats? Yes	No	T-test of 'Yes' versus 'No'
Interview year 2012					
Female	0.494	0.488	0.656	0.468	$p<0.05$
	(0.500)	(0.500)	(0.475)	(0.499)	
Age (demeaned)	-0.028	0.831	0.357	0.885	
	(11.921)	(11.387)	(11.629)	(11.358)	
Married	0.529	0.587	0.552	0.591	$p<0.05$
	(0.499)	(0.492)	(0.497)	(0.492)	
Cohabiting	0.188	0.176	0.156	0.178	$p<0.05$
	(0.391)	(0.381)	(0.363)	(0.383)	
Has children	0.441	0.470	0.450	0.472	
	(0.496)	(0.499)	(0.498)	(0.499)	
Ethnic minority backgrounds	0.053	0.040	0.045	0.039	
	(0.225)	(0.196)	(0.207)	(0.195)	
Healthcare sector	0.103	0.102	0.309	0.078	$p<0.05$
	(0.304)	(0.302)	(0.462)	(0.268)	
Other high risk sectors	0.147	0.148	0.357	0.124	$p<0.05$
	(0.354)	(0.355)	(0.479)	(0.329)	
Low risk sectors	0.750	0.751	0.335	0.798	$p<0.05$
	(0.433)	(0.433)	(0.472)	(0.401)	
N	2,263,768	22,931	2,688	20,243	
Interview year 2014					
Female	0.492	0.483	0.659	0.462	$p<0.05$
	(0.500)	(0.500)	(0.474)	(0.499)	
Age (demeaned)	-0.049	1.230	0.459	1.319	$p<0.05$
	(11.985)	(11.352)	(11.428)	(11.340)	
Married	0.517	0.591	0.576	0.592	
	(0.500)	(0.492)	(0.494)	(0.491)	
Cohabiting	0.194	0.182	0.178	0.183	
	(0.395)	(0.386)	(0.383)	(0.386)	
Has children	0.435	0.463	0.478	0.461	
	(0.496)	(0.499)	(0.500)	(0.498)	
Ethnic minority backgrounds	0.058	0.041	0.045	0.040	

	(0.234)	(0.198)	(0.207)	(0.197)	
Healthcare sector	0.107	0.108	0.350	0.080	$p<0.05$
	(0.309)	(0.311)	(0.477)	(0.272)	
Other high risk sectors	0.146	0.146	0.361	0.121	$p<0.05$
	(0.353)	(0.353)	(0.480)	(0.327)	
Low risk sectors	0.747	0.745	0.289	0.798	$p<0.05$
	(0.435)	(0.436)	(0.454)	(0.401)	
N	2,245,282	25,649	2,781	22,868	
Interview year 2016					
Female	0.491	0.492	0.645	0.473	$p<0.05$
	(0.500)	(0.500)	(0.478)	(0.499)	
Age (demeaned)	-0.056	1.011	0.651	1.055	
	(12.156)	(11.676)	(11.657)	(11.678)	
Married	0.501	0.548	0.501	0.553	$p<0.05$
	(0.500)	(0.498)	(0.500)	(0.497)	
Cohabiting	0.202	0.199	0.210	0.198	
	(0.401)	(0.399)	(0.407)	(0.398)	
Has children	0.423	0.447	0.429	0.449	
	(0.494)	(0.497)	(0.495)	(0.497)	
Ethnic minority backgrounds	0.066	0.048	0.052	0.048	
	(0.249)	(0.215)	(0.222)	(0.214)	
Healthcare sector	0.105	0.106	0.324	0.080	$p<0.05$
	(0.306)	(0.308)	(0.468)	(0.271)	
Other high risk sectors	0.138	0.141	0.346	0.117	$p<0.05$
	(0.345)	(0.349)	(0.476)	(0.321)	
Low risk sectors	0.758	0.752	0.330	0.803	$p<0.05$
	(0.429)	(0.432)	(0.470)	(0.398)	
N	2,269,663	28,808	3,081	25,727	

Note: The table shows means and standard deviations (in parentheses). Data are weighted yet *N* refers to the unweighted sample totals.

Figure A.1 Time trend in average proportion on sick leave benefits in Denmark



Note: The figure shows the proportion of survey participants who received sick leave benefits, by quarter and by exposure to (threat of) violence on the workplace, 2nd quarter of 2009 to 4th quarter of 2018. Each survey participant was followed from eight quarters before to eight quarters after the relevant interview period. Pooled (and weighted) data from all survey rounds.

Table A1. Parameter estimates from difference-in-differences model of proportion of weeks with sick leave benefits out of 104 weeks (2 years) prior to and following interview period. Full sample.

Variable	Estimate	(Standard error)
Pre survey base level (intercept)	0.016***	(0.001)
Victims pre survey	0.004***	(0.001)
Post survey	0.007***	(0.000)
Post survey X Victims	0.008***	(0.001)
Interview year 2014	-0.003***	(0.001)
Interview year 2016	-0.000	(0.001)
Female	0.009***	(0.000)
Married	-0.004***	(0.001)
Cohabiting	-0.002*	(0.001)
Age	0.000***	(0.000)
Has children	0.001**	(0.001)
Ethnic minority backgrounds	0.002	(0.001)
R^2	0.009	
$N \times T$	154,776	
N	77,388	

Note: The standard errors were clustered at the individual level.
* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Research in context

Evidence before this study

In a systematic review, we searched for articles published in English in the online databases Scopus, Medline and Sociological Abstracts. We used the following terms in different combinations: “work-related”, “workplace”, “work”, “violence”, “victimization”, “victimisation”, “consequences”, “public health”, “service sector”, “health care sector”, and “service jobs”. The search was carried out with no restrictions on publication date. We primarily included studies on work-related violence yet did not include studies on workplace bullying. Only a few studies on consequences of violence in general were included. Of excluded studies, many focused on intimate partner violence, which fall outside the scope of our study. In most of the studies of work-related violence, the relation between the victim and offender can be classified as a professional-client relationship. Professionals were typically human service workers of various kinds; health care providers, teachers, prison guards, and police officers. They were exposed to violence by patients, students, prisoners, and so forth.

The aim of most studies identified in the search had been to estimate the frequency of work-related violence, often within specific sectors. In addition, the studies also sought to uncover several predicting characteristics for victimisation. One variable that was found to be important for victimisation risk in multiple studies was prior victimisation. Other predicting variables were sex and occupation. Furthermore, the studies found associations between work-related violent victimisation and a series of negative outcomes such as stress, PTSD-syndrome, depression, reduced income, reduced working ability, and periods with sick leave benefits. These negative individual outcomes were also considered to cumulate into a problem from a public

health point of view. Most included studies had based their analyses on data from cross-sectional surveys, although a few of these also had a baseline measure. Most of the studies had small samples sizes.

Added value of this study

As many of the existing studies, this study estimated of the prevalence of work-related violent victimisation. Most existing estimates are based on self-report surveys, which is also the case in this study. Nevertheless, we claim to present a more reliable estimate because of a larger sample size. When analysing the association between victimisation and sick leave, we added value to existing research along two dimensions. First, we relied on administrative data on the receipt of sick leave benefits, thus overcoming potential biases associated with self-reported measures of sick leave. Second, we took into account sick leave prior to the survey (and the violent exposure), which we documented was an important confounder which previous studies have tended to ignore.

Implications of all available evidence

The results of existing research on work-related violent victimisation suggest that violence and threats constitute a very real feature of many people's everyday work life, especially within specific sectors, such as healthcare provision. Furthermore, evidence points to the fact that the consequences of work-related violence are substantial both in terms of the individuals affected by it and as a public health problem. The increased sick leave, which we documented in this study, is expensive for society as a whole all the while being a strong signal of reduced wellbeing among exposed employees.