
Original Article

Written violence policies and risk of physical assault against Minnesota educators

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Abstract Few research studies on school violence policies use quantitative methods to evaluate the impact of policies on workplace violence. This study analyzed nine different written violence policies and their impact on work-related physical assault in educational settings. Data were from the Minnesota Educators' Study. This large, nested case control study included cases ($n = 372$) who reported physical assaults within the last year, and controls ($n = 1116$) who did not. Multivariate logistic regression analyses, using directed acyclic graphs, estimated risk of assault. Results of the adjusted multivariate model suggested decreased risks of physical assault were associated with the presence of policies regarding how to report sexual harassment, verbal abuse, and threat (OR 0.53; 95 per cent CI: 0.30–0.95); assurance of confidential reporting of events (OR 0.67; 95 per cent CI: 0.44–1.04); and zero tolerance for violence (OR 0.70; 95 per cent CI: 0.47–1.04).

Journal of Public Health Policy (2010) 31, 461–477. doi:10.1057/jphp.2010.32

Keywords: workplace violence; injury; policy analysis; Zero tolerance policies

Background

Written violence policies may be an important part of preventing workplace violence. In the educational environment, both within the United States and abroad, educators are at risk for occupational violence. From 2009 data provided by the US Departments of Education and Justice for the 2003–2004 school year, up to 7 per cent of US teachers reported being physically attacked by a student from their school within the previous 12 months.¹ From the same data, up to 18 per cent of US teachers indicated they were threatened with injury by a student in the past 12 months.¹

Violence in education is not isolated to the United States. In France, incidents reported in the press for the 1999–2000 school year included events such as staff being molested, staff being slapped and spat upon, and cars being vandalized.² From a 2007 study in Germany, 4.4 per cent of teachers reported threats of violence within the previous 12 months.³ A survey of elementary school students in South Korea found an increase in the rate of school violence, from 11.9 per cent in 2001 to 17.4 per cent in 2002.⁴ Finally, a survey conducted by the Scottish Office and the Educational Institute of Scotland, over a period of 14 years, found a significant increase in students exhibiting physical aggression against teachers.⁵ Violence is an important public health problem in educational environments.⁶

Laws and policies to combat this violence exist at many levels. Within schools in the United States, several federal laws apply: the Guns Free School Act (GFSA) of 1994 (public law 103–382); Improving America's Schools Act of 1994 (formerly the Elementary and Secondary Education Act of 1965); Violent Crime Control and Law Enforcement Act of 1994; and the Safe Schools Act of 1994.^{7–11} The GFSA is typically cited as the beginning of zero tolerance policies in schools.^{7–9,11} In addition, the Occupational Health and Safety Administration published guidelines for workplace violence policies, including the recommendation of zero tolerance policies.¹²

School districts and schools use these laws, in conjunction with court rulings, to create violence prevention policies. These policies take the form of primary, secondary, and tertiary prevention.¹³ The prevalence of specific written violence policies, such as training requirements and confidentiality of reporting, is unclear. Currently, limited quantitative data exist on written violence policies in educational settings of US schools, especially their impact on



educators. The education literature often focuses on zero tolerance policies and the consequences of those policies on students. Information on other policies is limited.

Although some research has suggested zero tolerance policies – policies that call for action in response to the first and every occurrence – may play an important role in protecting populations in health-care settings, such policies may also have a negative impact on students and general school safety, especially for students of color or low socio-economic status.^{8,11,14–21} Some qualitative research suggests these policies may increase violence in schools in the United States as a result of their harsh consequences and resulting backlash.^{9,18,19,22–25} These adverse consequences are found in the United States, and in other countries such as France, Britain, and Canada where policies similar to a zero tolerance policy exist.^{2,25} Ambiguity about the benefit or downside of zero tolerance policies is evident in a study of middle and high schools in Texas. One-third of principals believed zero tolerance policies were helpful combatting school crime and nearly one-third believed they were hurtful.²⁶ None of these studies evaluated zero tolerance policies from the perspective of educators' safety.

The purpose of this analysis was to quantify the prevalence of specific written policies and to determine the impact of exposure to nine written violence policies on risk of physical assault on Minnesota educators. Previous occupational violence studies¹⁵ and feedback from an advisory board, comprising educators from the United States, were the basis for the nine policies selected into the study. We hypothesized that the presence of written violence policies would be protective, reducing risk of physical assault against Minnesota educators.

Methods

Overview

The data for this analysis were from the two phases of the Minnesota Educators Study (MES): (I) a comprehensive phase to collect data on the magnitude and consequences of and potential risk factors for physical and non-physical violence and (II) a nested case-control design to identify risk or protective factors for physical assault. The design drew on the successful Minnesota Nurses' Study.²⁷ The

University of Minnesota Institutional Review Board granted approval for the main study, and for this effort.

Target population

In May 2005, the Minnesota Department of Education's License List identified 320 333 licensed educators as potential study participants.²⁸ Pilot study ($n = 300$) results identified the need for the exclusion of 'lifetime' license holders because most were retired or deceased. Also excluded, were individuals whose licenses expired before the year 2003. From the remaining 116 661 educators, we randomly selected a cohort of 26 000 educators for a screening study to further determine eligibility. Eligibility required having worked as a Minnesota licensed educator, in a kindergarten through twelfth grade (K-12) school within the past 12 months (June 2004 – December 2005, depending on date of completion of the survey).

Data collection²⁹

The eligibility screening survey of the 26 000 licensed educators identified 6469 eligible participants on whom we conducted specially designed comprehensive (Phase I) and case-control (Phase II) surveys. Complete details regarding the recruitment, definitions and data collection processes are available in the MES final report.³⁰

To accomplish validation of written violence policy information, the educators' respective schools' principals completed a validation sub-study on the presence of written policies. This sub-study enrolled a random sample of approximately 10 per cent of the cases and controls.

Case and control definitions

Cases ($n = 372$) were those who reported at least one work-related physical assault event during the previous 12 months on the comprehensive, Phase I survey. If there had been more than one event report, it was the earliest that we used in Phase II. The reference month for exposure data collection was the month at work before the cases' earliest physical assault.

Controls were those who did not report any physical assault events. Three controls ($n = 1116$) were selected, at random, for each case. Each of the selected educators had one working month randomly selected for exposure data collection from their pool of eligible months. These eligible months were within the 13-month range reported as months in which the educator worked.

Policies

The Minnesota Nurses' Study,¹⁵ and feedback from an advisory board of educators from the United States, served as a basis for the policies addressed in this study. Cases and controls, respectively, reported on the presence of these policies before the assault, or target month, '... did your school have a written policy on violence that addressed ...': violence prevention training requirements; prohibited behaviors against employees; prohibited behaviors against students; how to report sexual harassment, verbal abuse, or threats; how to report physical assault; assurance of confidential reporting; consequences for those who engage in violence; zero tolerance policy for violence; a visitor policy.

Data analysis

We used multivariate unconditional logistic regression analyses to estimate odds ratios (OR) and 95 per cent confidence intervals (CI). Directed acyclic graphs (DAGs) served as a visual guide to identify variables pertinent to the multivariate models and potential confounders on the outcome of interest.^{31,32} DAGs allowed us to include variables believed to be causal to the exposure of interest and exclude variables that could not be causal. The DAG, Figure 1, shows relations among the exposures of interest, the outcomes, and other covariates. During the analysis, each policy used a separate analytical model, based on the assumptions illustrated in the DAG. The *enforcement* of policies, for example, although important, falls on the causal pathway between written policies and physical assault and, therefore, was not included in analyses.

Re-weighting techniques adjusted the models for non-response and selection.³³ These techniques addressed some of the potential bias in the study. Variables in the adjustment for non-response and selection

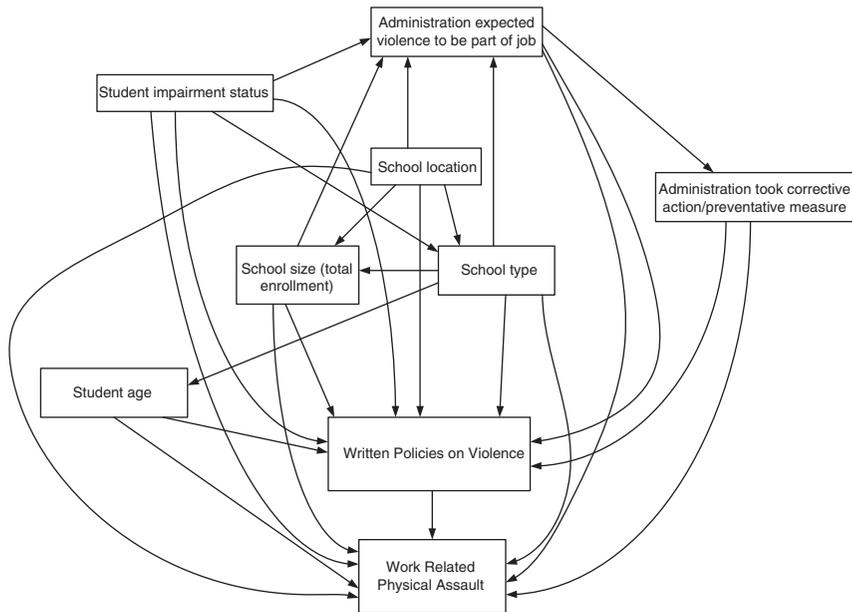


Figure 1: Impact of written violence policies on physical assault, causal model.

included year of birth; fiscal year data; zip code; principal and teacher years; salary; teaching time; and grade level(s) taught. The Minnesota Department of Education provided data for this adjustment.²⁸

Sensitivity analyses examined only the potential range of bias. These analyses did not adjust any of the multivariate models. Sensitivity and specificity data from a validation study established the priors for the sensitivity analyses.

Results

Response rates for the full study were: Phase I, 84 per cent; Phase II, 84 per cent. The adjusted annual physical assault rate per 100 educators was 8.3. Because students committed the majority of assaults ($n = 290$; 97 per cent), in this analysis we included only cases perpetrated by students.

On average, cases were 45 years old (range 23–67 years) and had worked as licensed educators for 15 years (range <1 year – 42 years). Controls had an average age of 46 years (range 24–79 years)



and had worked as licensed educators an average of 17 years (range < 1 year – 44 years). Ninety-eight per cent of participants were white and 99 per cent of controls were non-Hispanic. Table 1 lists other characteristics regarding participant demographics, schools, and students. Additional information can be found in the final report for the MES.³⁰ Table 2 lists the presence of written violence policies as reported by cases and controls.

Table 3 identifies the results of univariate, multivariate, and adjusted multivariate models with odds ratios and 95 per cent confidence intervals. Results of multivariate modeling showed a decreased risk of physical assault with the presence of a policy on how to report sexual harassment, verbal abuse, and threats (0.51; 0.29–0.90). Adjusted for non-response and probability of eligibility, presence of policies on how to report sexual harassment, verbal abuse or threat (0.53; 0.30–0.95), assurance of confidential reporting (0.67; 0.44–1.04), and zero tolerance policy for violence (0.70; 0.47–1.04) models continued to be suggestive of decreased risks of physical assault; however, for the latter two variables, the confidence interval included 1.0.

Monte Carlo analysis, using Crystal Ball 7.3 software and data from the validation sub-study, estimated potential biases from errors such as confounding, statistical assumptions, measurement error, and non-response.³⁴ This simulation established the potential range (0.40–0.65) and mean value (0.51) for the policy of reporting sexual harassment, threats, or verbal abuse. The simulated values were similar in direction and magnitude to the multivariate analyses. The response for the validation sub-study was 35 per cent (52/150). Responses were not weighted or adjusted for the simulations.

Discussion

The presence of certain workplace violence policies in the educational environment appeared to be associated with, or suggestive of, decreased risks of work-related physical assault. Consistent with prior expectations, most policies appeared to be associated with decreased risks. Although our study did not evaluate potential overlapping of types of policies and co-linearity, most results were mainly in agreement regarding their association with work-related physical assault. Until this study, only qualitative data were available

Table 1: Characteristics of educators, the educators' schools, and students by case-control status

<i>Educator, school, and student characteristics</i>	<i>Cases</i>		<i>Controls</i>	
	<i>N=290</i>	<i>%</i>	<i>N=867</i>	<i>%</i>
<i>Educator gender</i>				
Male	55	19	197	23
Female	235	81	670	77
Missing (refused)	0 (0)	0 (0)	0 (0)	0 (0)
<i>School type</i>				
Public	253	87	713	82
Public Alternative	14	5	30	3
Public Charter	8	3	17	2
Public Magnet	7	2	5	1
Private (Parochial)	3	1	78	9
Private (Non-Parochial)	1	0.3	15	2
Missing (refused)	4 (0)	1 (0)	9 (0)	1 (0)
<i>School location</i>				
Rural	91	31	327	37
Urban	90	31	183	21
Suburban	105	36	348	40
Missing (refused)	4 (0)	1 (0)	9 (0)	1 (0)
<i>School enrollment</i>				
Less than 50 students	12	4	16	2
50–200 students	33	11	100	12
201–500 students	106	37	269	31
501–1000 students	99	34	290	33
More than 1000 students	36	12	183	21
Missing (refused)	4 (0)	1 (0)	9 (0)	1 (0)
<i>Student age group</i>				
Less than age 5	1	0.3	4	0.5
5 years to less than 10	90	31	222	26
10 years to less than 13	34	12	140	16
13 years to less than 16	33	11	124	14
16 years to less than 18	23	8	112	13
18 years or older	3	1	6	0.7
Mixed age groups	17	6	41	5
Missing (refused)	5 (0)	2 (0)	7 (0)	< 1 (0)
<i>Student gender</i>				
Primarily male	82	28	112	13
Primarily female	5	2	34	4
Appeared equal	113	39	501	58
Missing (refused)	5 (0)	2 (0)	6 (0)	< 1 (0)

**Table 2:** Frequencies of written violence policies by case-control status

<i>Written violence policy</i>	<i>Cases</i>		<i>Controls</i>	
	<i>N=290</i>	<i>%</i>	<i>N=867</i>	<i>%</i>
<i>Requirements for violence prevention training of employees</i>				
Yes	118	41	268	31
No	110	38	322	37
Unsure	60	21	272	31
Missing (refused)	2 (0)	0.7 (0)	4 (1)	0.5 (0.1)
<i>Types of violent behaviors against employees that were prohibited</i>				
Yes	197	68	598	69
No	40	14	89	10
Unsure	51	18	175	20
Missing (refused)	2 (0)	0.7 (0)	4 (1)	0.5 (0.1)
<i>Types of violent behaviors against students that were prohibited</i>				
Yes	248	86	737	85
No	18	6	40	5
Unsure	22	8	85	10
Missing (refused)	2 (0)	0.7 (0)	4 (1)	0.5 (0.1)
<i>How to report sexual harassment, threats, or verbal abuse</i>				
Yes	214	74	673	78
No	32	11	51	6
Unsure	42	14	138	16
Missing (refused)	2 (0)	0.7 (0)	4 (1)	0.5 (0.1)
<i>How to report physical assault</i>				
Yes	216	75	647	75
No	39	13	66	8
Unsure	33	11	148	17
Missing (refused)	2 (0)	0.7 (0)	5 (1)	0.6 (0.1)
<i>Assurance of confidential reporting of violent incidents</i>				
Yes	165	57	501	58
No	65	22	106	12
Unsure	58	20	255	29
Missing (refused)	2 (0)	0.7 (0)	4 (1)	0.5 (0.1)
<i>Consequences for students who use violence</i>				
Yes	55	19	207	24
No	25	9	45	5
Unsure	44	15	132	15
Missing (refused)	2 (0)	0.7 (0)	5 (1)	0.6 (0.1)
<i>Consequences for employees who use violence</i>				
Yes	9	3	9	1
No	25	9	45	5
Unsure	44	15	132	15
Missing (refused)	2 (0)	0.7 (0)	5 (1)	0.6 (0.1)

Table 2 continued

<i>Written violence policy</i>	<i>Cases</i>		<i>Controls</i>	
	<i>N=290</i>	<i>%</i>	<i>N=867</i>	<i>%</i>
<i>Consequences for students and employees who use violence</i>				
Yes	155	53	468	54
No	25	9	45	5
Unsure	44	15	132	15
Missing (refused)	2 (0)	0.7 (0)	5 (1)	0.6 (0.1)
<i>Zero tolerance policy</i>				
Yes	171	59	532	61
No	74	25	153	18
Unsure	43	15	178	21
Missing (refused)	2 (0)	0.7 (0)	4 (0)	0.5 (0)
<i>Visitor policy</i>				
Yes	271	83	810	93
No	13	4	36	4
Unsure	4	1	13	1
Missing (not applicable)	2 (0)	0.7 (0)	5 (3)	0.6 (0.3)

about the relation between policies and work-related assault in educational environments.

Our analyses are among the first measures pertinent to zero tolerance policies and physical assault in an educational setting. Many have discussed risk associated with zero tolerance policies, but our study suggests reduced risks for physical assault in the presence of a zero tolerance policy.^{9,18,19,22–24} We found a prevalence of reported zero tolerance policies lower (cases: 59 per cent; controls: 61 per cent) than reported in the literature for the United States as a whole (79 per cent).^{18,35} Our results also suggest decreased risks of physical assault in the presence of policies on how to report sexual harassment, threats or verbal abuse, and assuring confidential reporting. Our findings complement and extend research by Munn *et al*⁵ who found teachers believed communication with senior staff and more coherent policies would achieve improved student behavior.

With an awareness of how to report violence and an institutional commitment to confidential reporting, it may be that the act of reporting based on the respective policies constitutes the mechanism



Table 3: Logistic regression analyses of presence of violence policies and physical assault

	Univariate model		Multivariate model ^a		Weighted multivariate model ^b	
	OR	95% CI	OR	95% CI	OR	95% CI
Requirements for violence prevention training of employees	1.29	(0.95, 1.75)	1.26	(0.87, 1.82)	1.21	(0.82, 1.76)
Types of violent behaviors against employees that were prohibited	0.73	(0.48, 1.10)	0.86	(0.53, 1.40)	0.78	(0.48, 1.27)
Types of violent behaviors against students that were prohibited	0.75	(0.42, 1.32)	0.94	(0.47, 1.88)	0.82	(0.40, 1.67)
How to report sexual harassment, threats or verbal abuse	0.51	(0.32, 0.81)	0.51	(0.29, 0.90)	0.53	(0.30, 0.95)
How to report physical assault	0.57	(0.37, 0.86)	0.64	(0.38, 1.08)	0.70	(0.41, 1.19)
Assurance of confidential reporting of violent incidents	0.54	(0.38, 0.77)	0.74	(0.48, 1.14)	0.67	(0.44, 1.04)
Consequences for students who use violence	0.48	(0.27, 0.85)	0.71	(0.35, 1.44)	0.78	(0.38, 1.59)
Consequences for employees who use violence	1.8	(0.63, 5.1)	1.31	(0.38, 4.51)	1.96	(0.57, 6.75)
Consequences for students and employees who use violence	0.60	(0.35, 1.0)	0.95	(0.49, 1.85)	0.88	(0.45, 1.71)
Zero tolerance policy	0.66	(0.48, 0.92)	0.79	(0.54, 1.17)	0.70	(0.47, 1.04)
Visitor policy	0.92	(0.48, 1.77)	1.12	(0.53, 2.37)	1.45	(0.64, 3.29)

^aMultivariate model adjusted for school type; school location; student age; student impairment status; drugs, illness/injury, and disability; administration's attitude toward violence.

^bMultivariate model adjusted for above variables and weighted for probabilities of response and eligibility-based data from the Minnesota Department of Education.

Abbreviations: CI – confidence intervals; OR – odds ratios.

for decreasing physical assault. In South Korea in 2002, the Youth Violence Prevention Foundation found that 30 per cent of assaults went unreported because educators feared the situation would worsen or continue unchanged.⁴ In situations like this, would policies on how to report or confidential reporting decrease the underreporting, and potentially decrease the rate of assault?

A study by Nachreiner *et al*, on a population of 6300 Minnesota nurses, and similar to the Minnesota Educators Study, did not find the presence of policies on reporting and confidentiality to be protective.¹⁵ Both the study by Nachreiner *et al* (OR = 0.5, 95 per cent CI 0.3–0.8), and our study found decreased risks for assault with presence of zero tolerance policies. Neither study found written policies on training about work-related violence prevention associated with risk of, or protection from, work-related physical assault.¹⁵ Results about nurses and educators suggest further research is needed in different occupational environments. Universal work-related violence policies may not protect in all work environments, comparably.

Given the causal model used in our study, data collection and analysis excluded some potentially important variables. Because enforcement of policies was part of the causal pathway, it could not be targeted in the analysis. Using other study designs and causal models, enforcement might be included in the analyses to determine what, if any, relations exist between the enforcement of policies and educators' awareness of the presence of written violence policies. We were also unable to include funding for policies in the analysis. As Han and Akiba⁴ suggest in their study of South Korea's School Violence Prevention and Countermeasure Act, without funding behind policies, changes are unlikely to happen. Adding variables such as enforcement and funding to the analysis might provide further insight into the impact of written violence policies on physical assault.

Limitations

Several study design strategies and analysis techniques minimized potential bias in our study. Clarification of unclear responses and validation sub-studies countered potential information biases. Confounding variables were identified, *a priori*, using DAGs.^{31,32}

In the multivariate analysis, we weighted observations using estimates for probabilities of response and eligibility, calculated from the original Minnesota Department of Education database.²⁸ Sensitivity analyses on selected policies enabled us to compute upper and lower bound estimates for risk.³⁶ As the range of the odds ratios remained below 1.0, our analysis demonstrated that, even when data were allowed to vary, based on sensitivity and specificity data, the true effect of the presence of a policy may be protective.

Unmeasured confounders, such as a 'high risk environment', may have affected our study results, likely making presence of policies appear less protective, if a 'high risk environment', for example, superseded the presence of the written violence policy. Although our surveys included questions to measure markers of 'high risk environments', and our analysis attempted to control for 'high risk environments', we did not have the power to explicitly evaluate policies within 'high risk environments'.²⁹

Individuals who refused or did not respond may have experienced increased work-related violence, compared to individuals who participated in the study. Cases also may have recalled exposures more accurately than controls. To minimize the potential for recall bias, participants reported on violent events that occurred within the previous 12 months (Phase I) and exposure data only for 1 month before the respective cases' events or the controls' randomly selected month (Phase II). This method was successful in previous studies.^{27,37}

Given the moderate sample size, we present ORs for the policies on zero tolerance policies and assurance of confidential reporting as important findings even though the confidence intervals slightly surpass 1.0. Dismissing this finding would negate the overall objective of the study – to find potential protective factors against physical assault in educators' environments. The ORs suggest the possibility that certain policies may be protective. Future research could build upon these findings and examine policies within a more controlled environment.

In summary, our study evaluated nine work-related written violence policies in Minnesota schools for their effect on educators' risk of physical assault. Results suggested that presence of policies about how to report sexual harassment, threats, or verbal abuse, assurance of confidential reporting, and zero tolerance policies for violence, may

help prevent work-related physical assault. Further research is necessary to examine why specific policies are protective only in certain populations, and how the results presented here differ in response to adding enforcement and funding of policies into the causal model.

Funding & Acknowledgments

Support for this research was provided, in part, by the National Institute for Occupational Safety and Health (NIOSH), Centers for Disease Control and Prevention, Department of Health and Human Services (R01 OH007816); Midwest Center for Occupational Health and Safety (NIOSH Training Grant Number T42 OH008434); Center for Violence Prevention and Control, University of Minnesota; and Regional Injury Prevention Research Center, University of Minnesota. The contents of this effort are solely the responsibility of the authors and do not necessarily represent the official view of the Centers for Disease Control and Prevention or other associated entities. The authors acknowledge the Minnesota Educators' Study research team, the Advisory Consulting Team of educators, Dr Bruce Alexander, and participating educators.

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