Violence Against Educators: A Population-Based Study

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Objectives: Identify the magnitude and risk factors for occupational physical assault (PA) and nonphysical violence (NPV) against Minnesota educators. **Methods:** Among 26,000 randomly selected licensed kindergarten to grade 12 educators, 6469 eligible educators reported whether they experienced PA or NPV during the prior year. Multiple logistic regression models were based on directed acyclic graphs. **Results:** Respective PA and NPV annual rates per 100 educators were 8.3 and 38.4. Work changes resulted among PA (13% to 20%) and NPV (22%) victims. Risks increased for master's prepared or education specialists who worked in public alternative schools and special education. Risks decreased for those working for more than 20 years, part time, and in private schools. Physical assault risk decreased when teaching grades 3 to 12 (vs kindergarten to grade 2), but NPV risk increased. **Conclusions:** Targeted efforts on specific violence risk and protective factors are essential to improve educators' work environments.

Numerous recent episodes of school violence have drawn public attention; yet, the focus has been, primarily, on violence against students, while violence against educators has been less emphasized.[1] Although the published scientific literature on violence directed toward educators is sparse,[2–4] it is recognized as an important problem that needs to be addressed.[5,6] On the basis of a report from the National Center for Education Statistics,[7] educators have experienced threats and assaults at variable rates throughout the United States. The percentage of public school educators who reported having been threatened, in the previous 12 months, ranged from 4% to 18% during the 2003 to 2004 school year. In the same report, it was identified that 8.2% of Minnesota's educators had been threatened with injury by a student and 3.6% were physically attacked by a student during the previous 12 months.[7]

The issue of violence against educators is important for school administrators and for the public, as there is a national shortage of educators in areas, including mathematics, physics and chemistry, languages, and special education (physical disabilities and emotional/behavioral disorders). In Minnesota, educator shortages include all areas of special education, world languages, math, physical sciences, art, and music.[8] Safety on the job is one factor potentially influencing educator recruitment and retention.

To address deficiencies in knowledge about work-related violence among educators, more comprehensive investigation was necessary. The purpose of this study was to identify the magnitude of, and potential risk factors for, work-related violence, both physical assault (PA) and nonphysical violence (NPV), among Minnesota's kindergarten through grade 12 (K-12) educators.

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DOI: 10.1097/JOM.0b013e31820c3fa1

METHODS

Study Population

This study examined the population of licensed K-12 educators in Minnesota as of 2003, a population that was selected because it is one of the few occupations known to be at risk for which there is an available comprehensive database (with contact addresses) for selection of subjects. Because licensing is required for Minnesota educators, the study population was expected to be a dynamic, but somewhat stable, cohort through time. A random sample of 26,000 educators was selected from this group of licensees.

This study was approved by the institutional review board at the University of Minnesota. Participation in this study was voluntary. Each educator received an information sheet about study participation. By returning a completed questionnaire via mail, participants consented to involvement in the study.

Definitions

In this study, *work-related violence* was defined as the intentional use of physical force or emotional abuse against an employee, which resulted in physical or emotional injury and consequences. This included PA and NPV. Work-related events included any activities associated with the educator's job or events that occurred in his/her work environment; work-related travel was included. Physical assault occurred when educators were hit, slapped, kicked, pushed, choked, grabbed, sexually assaulted, or otherwise subjected to physical contact intended to injure or harm. Nonphysical violence included threats, sexual harassment, verbal abuse, and bullying. *Threat* was defined as when someone used words, gestures, or actions with the intent of intimidating, frightening, or harming them (physically or otherwise). *Sexual harassment* occurred when educators experienced any type of unwelcome sexual behavior (words or actions) that created a hostile work environment. *Verbal abuse* occurred when another person yelled or swore at the educator, called the educator names, or used other words intended to control or hurt. *Bullying* was defined as repeated acts of intimidation or coercion. These definitions were primarily consistent with those incorporated in a prior occupational violence study[9,10] and were approved for the current study in consultation with our educational advisory consulting team; overall, they reflected those identified by the National Institute for Occupational Safety and Health.[11]

Study Design

The study involved two phases: phase 1, the only focus of this article, was to estimate the frequency of work-related violence, resulting symptoms, feelings, and work changes and to identify potential risk factors. An initial pilot study of methods and data collection instruments was conducted among 300 randomly selected educators, identified from the list of 320,333 total Minnesota Department of Education–licensed educators (Fig. 1), using a random number generator. From this pilot study, a lower-than-expected response (30%) was identified, in part, due to a large proportion of "lifetime licensees" who were found to be deceased or no longer

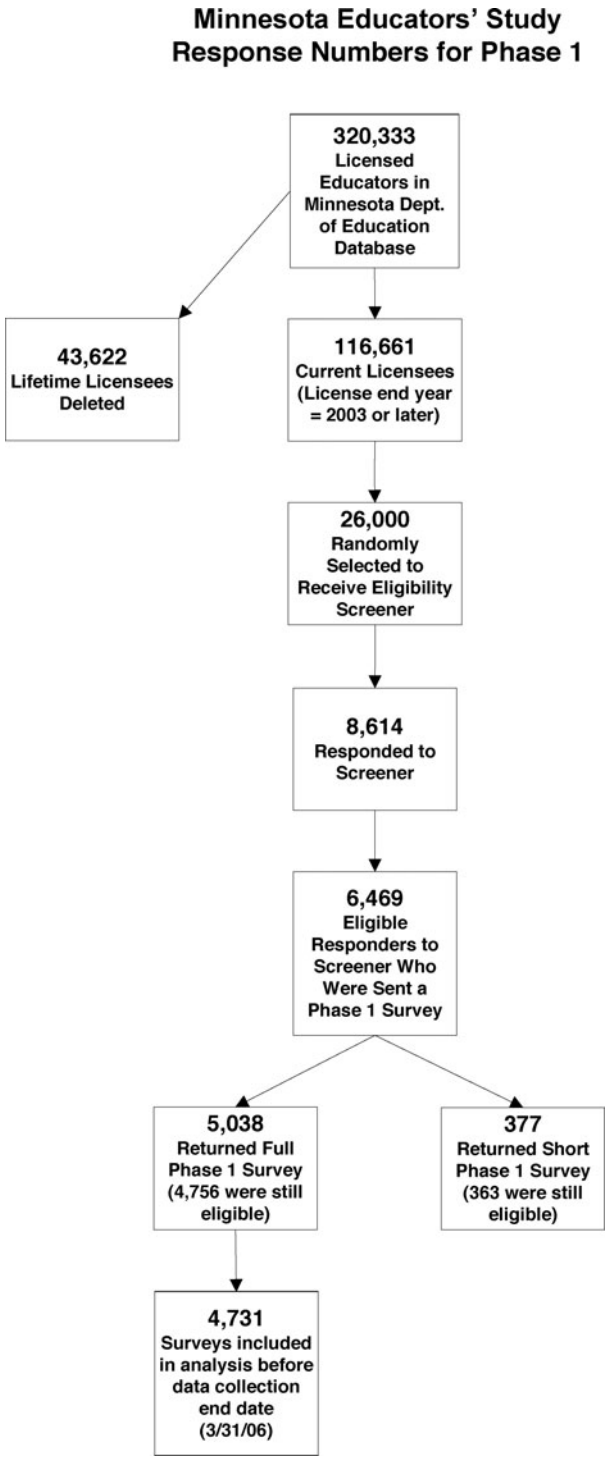

FIGURE 1. Minnesota educators' study response numbers for phase 1.

working and, consequently, deleted from the database. As a result, it was necessary to send a screening survey to a random sample of 26,000 educators identified on the remaining license list to establish eligibility before the implementation of the comprehensive study. Eligible educators were those who were licensed and had worked in Minnesota during the previous 12 months. The number of educators who responded to the screener was 8614 (33%), and 75% of these educators (6469) were eligible to participate. Using the number of PAs identified in the pilot study, the sample size for the screener was estimated to yield 500 cases (educators with at least one PA event during the previous 12 months). Figure 1 identifies the response flow diagram. Data were collected between April 27, 2005, and March 31, 2006.

Contact Procedures

An initial packet was sent to 6469 educators meeting eligibility criteria, as identified from the screening survey. This packet included: a specially designed survey instrument pertinent to work-related violence; a letter, inviting participation and providing informed consent information; and a postage-paid, return envelope. Up to four mailings were sent to optimize the response rate. If no response was received, a final packet including a one-page survey, cover letter, and postage-paid, return envelope was sent to ascertain only the most important demographic and work-related violent event information.

Data Collection Instruments

The comprehensive survey included the following data collection instruments: (1) whether or not the educator worked in a Minnesota school (K-12) in the previous 12 months and during which months. (Eligibility was further confirmed through this survey because it was possible that the educators' work situations might have changed from the time they completed the screening survey); (2) demographic and work-related information, such as gender, age, race, marital status, years of experience, education, year of graduation, training, job activity, grades taught, job class, class size, and school type; and (3) information on work-related violent events (both PA and NPV) during the study period. Data collection for each event included date(s) of the event(s), description of the perpetrator(s) involved, surrounding circumstances and activities at the time of the event(s), location of the event(s), type of injury(ies)/diagnosis(es) and anatomical location(s), relevant length of restricted activities, medical treatment sought or self-administered, and lost work time. The data collection instruments accommodated as many as four specific PA events; participants who experienced frequent events could also respond pertinent to ongoing events. Relevant data collection instruments and materials are located at the Center for Violence Prevention and Control Web site: http://www1.umn.edu/cvpc/research.html.

Data Analyses

Descriptive statistics were employed first to report the frequencies of sample demographics and the descriptors of reported events, as well as reported symptoms and work changes resulting from the violence. Generalized linear models were used to calculate incidence rates for both PA and NPV against educators. An indicator variable (yes/no) was used for each outcome of interest (PA and NPV), and logistic regression was used to generate a confidence interval (CI) for each incidence rate. Odds ratios were calculated by using logistic regression models to determine the strength of the associations between exposures of interest and each outcome of interest (PA and NPV).

Selection bias arising from differential response patterns in the cohort was a potential concern. To minimize this possible bias, we fit models adjusted for response bias by inversely weighting observed responses by probabilities of response, estimated as a function of characteristics available from the licensing database.[12] This method reweighs estimates by using group response characteristics to account for potential differences in responses. These characteristics included year of birth, first and last year of licensure, last fiscal year of employment, gender, zip code, years worked as a teacher or principal, salary, class period minutes, class periods per week,

and grade levels taught. To account for unknown eligibility among nonrespondents, probability of eligibility was estimated from these same factors.[13] Validation procedures, for injury event and exposure reporting, are identified elsewhere[14]; respectively, these procedures enabled the evaluation of the potential error in injury self-reporting through comparison with health care records and, for work-related exposures, between respondent and employer reporting.

A causal model, based on literature, including a similarly designed study[9,10] and expert knowledge, was based on the epidemiological model of human damage involving the dynamic interactions of host(s), agent(s), and vehicle(s) (or vectors) within the environment.[15,16] The associations between demographic factors or environmental exposures and PA or NPV were examined by using logistic regression models. Directed acyclic graphs (DAGs) were derived from the causal model and used to select the minimum sufficient set of potential confounders for the relevant exposures of interest, following the methods described by Greenland et al[17] and as illustrated by Hernan et al.[18] When selecting potential confounders, the DAG allows a choice of only those variables believed to be causal to the exposure of interest while excluding variables that are believed not to be causal. This enables identification of parsimonious models and excludes covariates that should not be entered into the regression lest they introduce bias. Figure 2 presents an example of DAG for one exposure of interest—professional activity.

Sensitivity Analysis

To examine the effect of a potential unmeasured confounder on the risk of violence for educators performing specific professional activities, a sensitivity analysis was conducted. Special education funding level was hypothesized as an unmeasured confounder that may influence the association between violence and the educator's primary professional activity; the funding level was analyzed as a binary variable: whether or not the per-child special education instruction expenditure for the school was lower than the state average. This information was obtained for a subset of the educators in the study who provided their school name on the completed survey.

RESULTS

Among the 6469 eligible educators, initially identified through the screening survey, 84% (5415) responded, with 78% (5038) returning the full comprehensive survey instrument (Fig. 1). Of these, 4731 responders met eligibility criteria by confirming that they had worked as licensed K-12 educators in Minnesota during the prior 12 months; the remaining were not eligible, based on this time period. Characteristics of the eligible study participants who returned a comprehensive survey revealed that 76% were women and the average age was 46 (SD, 10.6) years. The highest level of education was most commonly a master's degree, followed by a bachelor's degree (Table 1).

As shown in Table 1, educators most frequently reported that the schools in which they worked were public (84.7%) or private (7.9%) schools. Largely, they worked full-time and described themselves as "classroom educators." While approximately one-third worked with more than one grade level, very small percentages worked solely in each of the respective grades between kindergarten and 12th grade. Compared with specific topics courses, one-fourth taught general elementary education courses. Typical class sizes reported were between 25 to fewer than 45 students and 10 to fewer than 25 students.

As shown in Table 2, the adjusted PA rate for educators in Minnesota, based on incurring at least one assault, was 8.3 per 100 educators per year. For NPV (threats, sexual harassment, verbal abuse, and/or bullying), the overall adjusted rate was 38.4 per 100 educators per year; rates for the respective NPV categories are shown in the table. Educators described events, either as specific events (one time to up to four in the reporting period) or those that were "ongoing."

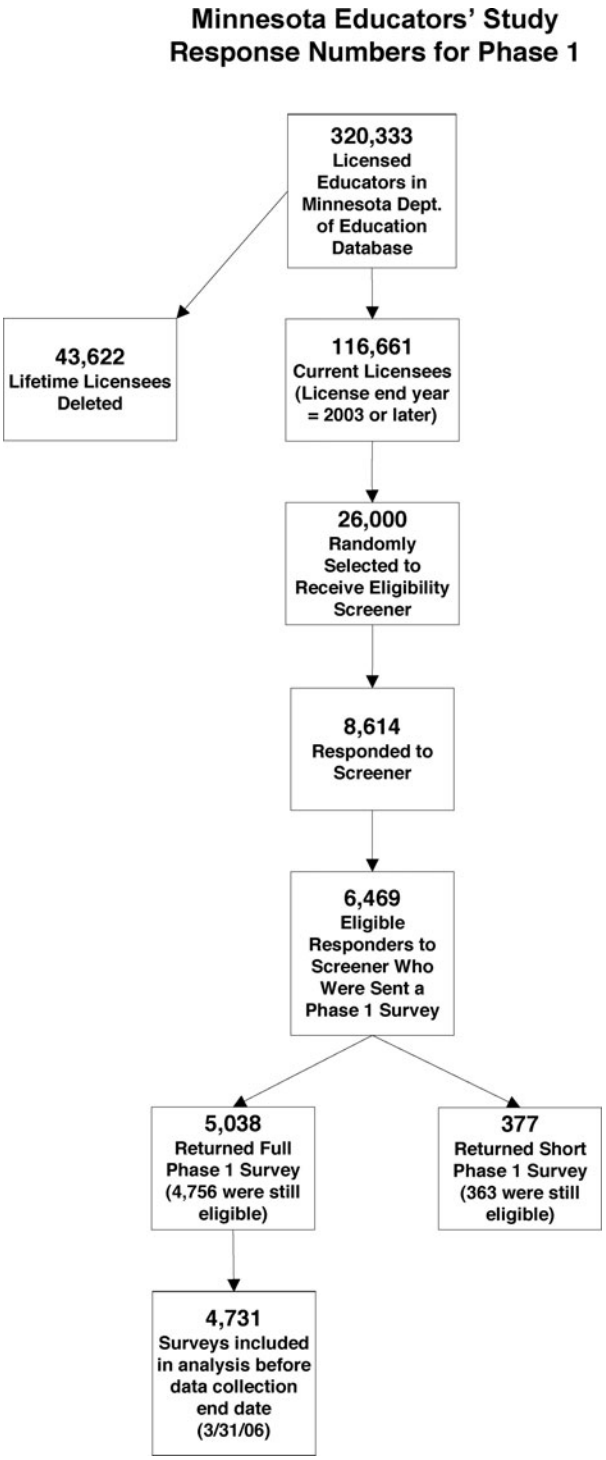

FIGURE 2. Directed acyclic graph example exposure of interest: primary professional activity.

In Table 3, reporting was based on PA (specific or ongoing events) and NPV (threats, sexual harassment, verbal abuse, and/or bullying). It is shown that the majority of PA events (95%) were perpetrated by students, while perpetrators of NPV were more varied and included students (75%), parents/visitors/trespassers (20%), and school employees (17%).

TABLE 1. Comprehensive Study Participant Characteristics

	N	%
Gender		
Female	3628	76.7
Male	1103	23.3
Age (yrs)		
<30	416	8.8
30–<40	1033	21.8
40–<50	1242	26.3
50–<60	1732	36.6
60 or older	308	6.5
Education		
Associate degree/bachelor's degree	1801	38.1
Master's degree	2530	53.5
Education specialist degree	309	6.5
Doctorate degree	69	1.5
Missing	22	0.5
Yrs worked as an educator		
<10	1398	29.6
10–<20	1425	30.1
20 –<30	1103	23.3
30 –<40	778	16.4
Missing	27	0.6
Marital status		
Married	3750	79.3
Not married	943	19.9
Missing	38	0.8
Type of school worked the most time		
Public	4006	84.7
Private (parochial)	309	6.5
Public alternative	160	3.4
Public charter	86	1.8
Public magnet	64	1.4
Private (nonparochial)	64	1.4
No one school was most common	29	0.6
Missing	13	0.3
Years worked at current school		
<5	1543	32.61
5–<10	1156	24.43
10–<20	1172	24.77
20 or more	763	16.13
Missing	97	2.05
Job classification		
Full-time contract	3764	79.6
Part-time contract	420	8.9
Long-call substitute	69	1.5
Building substitute	15	0.3
All other substitutes	409	8.7
Multiple classifications	34	0.7
Missing	20	0.4
Typical class size		
<10	724	15.3
10–<25	1666	35.2
25–< 45	1805	38.2
45–<55	22	0.5
55 or more	38	0.8
Missing	15	0.3
Did not teach students during prior 12 mo	461	9.7
One most frequent professional activity in past 12 mo		
Classroom teacher	3196	67.6
Special education	595	12.6
Administrator/superintendent/dean of students	197	4.2
School social worker	66	1.4
School psychologist	46	1.0
Speech/language pathologist	29	0.6
Department chair/instructional leader	22	0.5
Other	317	6.7
No one activity most common	251	5.3
Missing	12	0.25
Grade level(s) taught most frequently in past 12 mo		
Kindergarten–2nd	659	13.9
3rd–6th	908	19.2
7th–9th	609	12.9
10th–12th	426	9.0
No one grade level was most frequently taught	1643	34.7
Missing	25	0.5
Did not teach students during prior 12 mo	461	9.7

TABLE 2. Work-Related Violence Rates*

	Unadjusted Rate (95% Confidence Interval)	Adjusted Rate (95% Confidence Interval)*
Violence rates per 100 persons per year		
Physical	8.3 (7.6–9.1)	8.3 (7.6–9.1)
Nonphysical	38.6 (37.3–39.9)	38.4 (37.1–39.8)
Nonphysical violence rates per 100 persons per year		
Threat	20.3 (19.2–21.5)	20.6 (19.5–21.8)
Sexual harassment	4.5 (3.9–5.1)	4.5 (3.9–5.1)
Verbal abuse	33.4 (32.1–34.7)	32.9 (31.6–34.3)
Bullying	11.7 (10.8–12.6)	11.6 (10.7–12.6)

*Adjusted for nonresponse, eligibility.

The majority of perpetrators associated with PA were described as impaired because of disability or developmental delay (78%), while approximately 16% were described as "not impaired." In contrast, perpetrators associated with NPV were less frequently perceived as impaired because of disability or development delay (35%), while 56% were described as "not impaired." Only very-small proportions were perceived as being under the influence of alcohol, aerosols, or drugs (prescribed or nonprescribed).

Males were the primary perpetrators for both PA and NPV. Physical assault was most often perpetrated by those younger than 13 years (71%). However, NPV was distributed among all age groups.

By location (not shown), the PA-specific events occurred primarily in classrooms (65%) and hallways (22%). Anatomically, specific PA events primarily involved the arm/elbow/wrist (41%) or leg (31%); also involved were the face (9%), hand/finger/thumb (8%), back (6%), and head/skull/brain (4%). The proportions were higher for ongoing events than for specific events. The resulting types of physical injuries (for either specific or ongoing events), reported most

TABLE 3. Characteristics of Perpetrators Associated With Physical and Nonphysical Violence

	Physical (Specific Event)		Physical (Ongoing Event)		Nonphysical*	
Characteristics of Perpetrators	***N***	**%**	***N***	**%**	***N***	**%**
Professional relation with perpetrator†						
Student	560	95.4	61	100	2483	75.4
School employee	9	1.5	3	4.9	552	16.8
Parent/visitor/trespasser	5	0.9	0	0	656	19.9
Other	2	0.3	0	0	39	1.2
Missing	14	2.4	0	0	4651	1.5
Perceived impairment status of perpetrator†						
Yes, because of disability or developmental delay	460	78.4	56	91.8	1150	34.9
Not impaired	91	15.5	5	8.2	1853	56.2
Yes, because of injury or illness	10	1.7	3	4.9	37	1.1
Yes, under the influence of alcohol, aerosols, or drugs (prescribed or nonprescribed)	9	1.5	2	3.3	166	5.0
Unsure	29	4.9	3	4.9	411	12.5
Missing	10	1.7	0	0	59	1.8
Perpetrator gender†						
Male	453	77.2	54	88.5	2545	77.2
Female	122	20.8	27	44.3	1485	45.1
Unsure	3	0.5	0	0	53	1.6
Perceived age of perpetrator, age †						
<13 yrs	418	71.2	47	77.1	985	29.9
13–<16 yrs	121	20.6	15	24.6	1107	33.6
16 yrs–<18 yrs	31	5.3	4	6.6	768	23.3
Adult	9	1.5	3	4.9	1056	32.1
Unsure	2	0.3	0	0	27	0.8
Missing	10	1.7	0	0	48	1.5

*Nonphysical violence category combines threats, sexual harassment, verbal abuse, and bullying categories.
†Question denotes "check all that apply;" therefore, responses may total >100%.

frequently, were bruises/contusions, temporary discolorations/slap marks, cuts/lacerations/ scratches, or abrasions.

The "assault instruments" used in the PA (not shown), for specific events, were hands/arms (81%), feet/legs (53%), and teeth (14%). Very-small proportions of either the PA (<1%) or NPV (<1%) cases were hospitalized. Treatment reported as a result of PA or NPV events included self-treatment (11%, PA-specific events; 23%, PA ongoing events; and 8%, NPV) and treatment by health care providers (9%, PA-specific events; 26%, PA ongoing events; and 8%, NPV). Large proportions of educators reported having no treatment (77%, PA-specific events; 62%, PA ongoing events; and 81%, NPV).

The most commonly reported symptoms and feelings for both PA and NPV were frustration, anger, fear/anxiety/stress, sadness, fatigue, difficulty sleeping, and irritability, with much greater proportions reported for NPV for each of the symptoms and feelings (Table 4). Moreover, these were reported to last at least a month for 21% to 24% of the PA cases and 35% of the NPV cases. Between 13% and 20% of educators reported changes in their work status as a result of PA; however, 22% among those who reported NPV identified changes, including 9% who quit or transferred to another location.

In Table 5, results of multivariate, weighted analyses identify associated odds ratios and 95% CIs. Decreased risks for both PA and NPV were shown for men, compared with women; those who worked as educators for 30 to less than 40 years, compared with those who worked for less than 10 years; worked in their current school for 20 years or more, compared with those who worked for less than 5 years; and worked in private (parochial) compared with public schools. In addition, risk of NPV was also decreased with increase in age per year and for those who worked in private (nonparochial) schools.

Increased risks of both PA and NPV were identified for educators who: were not married versus married; had a master's degree or education specialist degree compared with those with associate/bachelor's degrees; worked in a public alternative compared with public school; and worked in special education compared with general classroom teaching. Risks of PA were also increased for those who worked as school psychologists, school social workers, department chair/instructional leaders, speech language pathologists, or those who identified no single common activity. Compared with kindergarten through grade 2, working in all other grades increased the risk of NPV but decreased the risk for PA. Larger class sizes, compared with those involving fewer than 10 students, also resulted in lower risks of PA and NPV.

Results of the sensitivity analysis indicated that a hypothesized unmeasured confounder—special education instructional expenditure—had a very modest effect on the association between risk of PA and the primary professional activity. After adjusting for this previously unmeasured confounder in this subset of educators for whom we had information about this potential confounder, the risk of assault for special education educators decreased from 6.5 (95% CI, 4.2 to 10.14) to 6.3 (95% CI, 4.0 to 9.9).

DISCUSSION

This is among the first major studies to document the magnitude and resulting symptoms from work-related violence within a population of educators and to identify potential risk or protective factors. The high response rate was accomplished through the implementation of rigorous follow-up methods. Of particular importance is the evidence of high rates of both PA (8.3) and NPV

TABLE 4. Symptoms, Feelings, and Work Changes Resulting From Physical and Nonphysical Violence

	Physical (Specific Event)		Physical (Ongoing Event)		Nonphysical Violence*	
	N	%	*N*	%	*N*	%
Symptoms/feelings after assault†						
Frustration	303	51.6	39	63.9	2290	69.5
Anger	214	36.5	21	34.4	2008	60.9
Fear/anxiety/stress	165	28.1	18	29.5	1371	41.6
Sadness	147	25.0	19	31.2	1123	34.1
Fatigue	135	23.0	25	41.0	948	28.8
Irritability	60	10.2	11	18.0	906	27.5
Difficulty sleeping	56	9.5	11	18.0	734	22.3
Stress-related symptoms (headaches, stomach problems, etc)	51	8.7	9	14.8	650	19.7
Depression	50	8.5	5	8.2	525	15.9
Shame/low self-esteem/low self-confidence	37	6.3	5	8.2	448	13.6
Intrusive thoughts about the event	31	5.3	2	3.3	535	16.2
Withdrawing from contact with people	24	4.1	3	4.9	270	8.2
Hyperarousal/hypervigilance/overly cautious	22	3.8	4	6.6	324	9.8
Difficulty concentrating	20	3.4	2	3.3	397	12.1
Resurfacing memories of previous trauma	11	1.9	0	0	182	5.5
Avoidance of any reminders of the event	10	1.7	0	0	215	6.5
Other	9	1.5	1	1.6	90	2.7
Nightmares	5	0.9	1	1.6	122	3.7
Flashbacks	5	0.9	1	1.6	103	3.1
Hallucinations	0	0	0	0	7	0.2
Missing	14	2.4	2	3.3	68	2.1
Symptoms lasted for at least 1 mo?						
Yes	143	24.4	13	21.3	1149	34.9
No	413	70.4	47	77.1	2005	60.9
Missing	27	4.6	1	1.6	121	3.7
None	140	23.9	12	19.7	273	8.3
Changes in your work situation as a result of event(s)†						
Quit your job	13	2.2	0	0	121	3.7
Voluntary transfer to another location	9	1.5	1	1.6	159	4.8
Involuntary transfer to another location	0	0	0	0	27	0.8
Leave of absence	1	0.2	0	0	40	1.2
Restriction/modification of work activities	25	4.3	10	16.4	165	5.0
No Changes	513	87.4	49	80.3	2572	78.1
Other	5	0.9	0	0	39	1.2
Student/Perpetrator Treated/Moved	14	2.4	2	3.3	86	2.6
Educator Plans to Leave	0	0	0	0	28	0.9
Missing	10	1.7	0	0	102	3.1

*Nonphysical violence category combines threats, sexual harassment, verbal abuse, and bullying categories.
†Question denotes "check all that apply;" therefore, responses may total >100%,

(38.4) per 100 educators per year. However, these rates are considered conservative, given that they were based on persons incurring a minimum of one work-related PA or NPV event per year when, in fact, there was evidence of some educators incurring multiple events; for example, 34% of educators reported "multiple events" because they were given an option to identify up to four distinct PA events, while 16.4% of those who experienced more-frequent events (including daily) had the option of reporting "ongoing" events. As a conservative approach, a maximum of one event was included in the numerator for the rate calculations.

Despite a lack of comparability with other studies, due to different study methods, populations studied, and definitions of violence, some findings were similar, while others were contradictory with regard to the gender of perpetrators and gender of the educators experiencing violence. Contrary to previous research, male, compared with female educators, were less likely to experience violence[9,19–22]; this may, in part, relate to differences in exposures, given the disparity among studies. However, findings that males were more frequently identified as perpetrators were consistent with previous efforts.[23–25] Also, consistent with some previous research, younger age was associated with an increased likelihood of incurring violence in the occupational environment.[9,10,26–28] In the current study, students were reported most frequently as the perpetrators of PA and NPV, consistent with data from Binns and Markow.[29] Also important, is that the majority of students were perceived to be impaired, primarily due to disability or developmental delay versus injury or illness or the influence of alcohol, aerosols, or drugs. Unexpected findings were that PA was most often perpetrated by those younger than 13 years, versus older students, while NPV perpetrators represented a broader age range and diver-

TABLE 5. Multivariable Analyses of Occupational Exposures and Risk of Physical Assault and Nonphysical Violence*

Educator Characteristics and Exposures	Physical Assault Odds Ratio	Physical Assault 95% Confidence Interval	Nonphysical Violence Odds Ratio	Nonphysical Violence 95% Confidence Interval
Educator age, yrs†				
22–<30	0.99	0.70–1.41	1.07	0.88–1.29
30–<40	1.02	0.77–1.36	1.13	0.96–1.31
40–<50	1.10	0.83–1.46	1.06	0.91–1.24
50–<60	1	–	1	–
60 or older	0.70	0.39–1.26	0.80	0.60–1.07
Educator gender†				
Male	0.78	0.61–1.00	0.88	0.77–1.00
Female	1	–	1	–
Marital status‡				
Married	1	–	1	–
Not married	1.33	1.04–1.71	1.39	1.20–1.60
Education§				
Associate degree/bachelor's degree	1	–	1	–
Master's degree	1.46	1.15–1.86	1.34	1.18–1.52
Education specialist degree	2.10	1.38–3.19	1.64	1.27–2.11
Doctorate degree	1.73	0.70–4.26	1.46	0.86–2.49
Years worked as an educator¶				
< 10	1	–	1	–
10–<20	0.95	0.72–1.27	0.90	0.77–1.06
20–<30	0.78	0.54–1.14	0.74	0.60–0.91
30–<40	0.63	0.39–1.01	0.61	0.47–0.80
Contract status**				
Full-time contract	1	–	1	–
Part-time contract	0.39	0.23–0.64	0.64	0.50–0.80
Long-call contract	0.43	0.14–1.28	0.57	0.34–0.97
Building substitute	0.57	0.07–4.61	1.19	0.39–3.62
All other substitute	0.25	0.13–0.45	0.52	0.40–0.66
Multiple	0.63	0.19–2.11	0.75	0.36–1.56
Type of school††				
Public	1	–	1	–
Public alternative	1.75	1.09–2.81	4.09	2.86–5.84
Public magnet	1.45	0.68–3.12	1.53	0.92–2.55
Public charter	0.53	0.22–1.29	1.06	0.71–1.59
Private (parochial)	0.16	0.06–0.40	0.37	0.28–0.50
Private (Nonparochial)	0.12	0.01–1.22	0.52	0.30–0.91
Years worked at current school‡‡				
<5	1	–	1	–
5–<10	0.93	0.70–1.23	0.90	0.77–1.05
10–<20	0.87	0.62–1.22	0.86	0.71–1.04
20 or more	0.35	0.21–0.60	0.67	0.52–0.86
Job activity§§				
Classroom teacher	1	–	1	–
Department chair/instructional leader	5.34	1.67–17.05	0.68	0.24–1.91
Special education	4.85	3.71–6.34	1.65	1.37–1.99
School social worker	4.78	2.55–8.98	1.51	0.90–2.53
Speech/language pathologist	4.16	1.45–11.91	0.73	0.31–1.74
School psychologist	3.36	1.40–8.05	1.71	0.92–3.20
Administrator/ superintendent/ dean of students	1.64	0.88–3.05	1.49	1.03–2.14
Other	1.25	0.74–2.11	0.99	0.76–1.28
No one activity was most common	2.40	1.53–3.77	1.09	0.82–1.44
Grade taught¶¶				
Did not teach students	0.34	0.19–0.60	1.28	0.91–1.79
Kindergarten through grade 2	1	–	1	–
Grade 3–grade 6	0.63	0.43–0.94	1.48	1.18–1.86
Grade 7–grade 9	0.42	0.27–0.67	2.49	1.94–3.19
Grade 10–grade 12	0.25	0.14–0.47	2.54	1.93–3.35
No one grade most frequently taught	0.76	0.53–1.07	2.24	1.81–2.79
Class size***				
Did not teach students	0.36	0.21–0.60	0.64	0.46–0.88
<10 students	1	–	1	–
10–<25 students	0.67	0.47–0.94	0.82	0.65–1.03
25–<45 students	0.39	0.26–0.58	1.22	0.96–1.55
45 students or more	0.11	0.01–1.14	0.90	0.49–1.64

*Results are adjusted for nonresponse and eligibility.
†No additional covariates.
‡Adjusted for gender, race, and age.
§Adjusted for gender, race, age, and marital status.
¶Adjusted for gender, race, age, marital status, and education.
**Adjusted for education, gender, race, age, marital status, school type, years worked in current school, and grade taught.
††Adjusted for education, gender, race, age, marital status, job class, and total years worked.
‡‡Adjusted for education, gender, race, age, marital status, total years worked, activity, and job class.
§§Adjusted for education, gender, age, race, marital status, job class, total years worked, years worked in current school, and school type.
¶¶Adjusted for education, gender, race, age, marital status, years worked in current school, total years worked, activity, job class, and school type.
***Adjusted for education, gender, race, age, years worked in current school, total years worked, activity, job class, and school type.

sity of people involved. Additional study is needed to assess characteristics of these student–educator events for potentially modifiable factors.

Consistent with the current study, educators in public, compared with other types of schools, have also been identified at increased risk.[7,30] In particular, compared with classroom educators, special education educators, social workers, and speech pathologists were also identified at increased risk in the current study. Additional research is necessary to better understand the specific activities and environments that may contribute to these increased risks.

The physical, emotional, and financial costs of occupational violence to the victim, and society, in general, appear to be important. Adverse symptoms of occupational violence, reported in the current study are similar to those reported by others, from various studies, including those conducted in health care environments.[10,31] Even in the absence of significant injury, some assaulted staff experienced moderate to severe reactions for as long as 6 months to 1 year. In a study by Caldwell,[31] of 224 clinical mental health staff (55% response rate), 61% experienced symptoms of posttraumatic stress disorder, similar to symptoms reported in the current study. Findorff-Dennis et al[32] found that the consequences of physical violence

appeared to continue long after the event occurred; workers' health and quality of life were affected significantly and resulted in job changes, chronic pain, changes in functional status, and depression for as long as 4 years after the assault.

As in a previous study of work-related violence against nurses,[10] this study found significant effects after violent events, with NPV resulting in greater percentages of post-event symptoms and feelings than PA. Also, more educators made changes to their work situations (such as transferring to another area or quitting) because of nonphysical, compared with physical, violence. Of interest, relevant to these findings, was the evidence identified through multivariate analyses that, for educators working in grades 3 to 12, compared with kindergarten through grade 2, the risk of NPV was increased, but it was decreased for PA. On the basis of expert consultation with educator advisors, it was acknowledged that, typically, penalties for PA perpetrators were gradually increased with increased grade levels; yet, this was not necessarily the case for NPV perpetrators. This serves as a basis for further investigation into the dynamic interactions in school environments, including the presence and enforcement of violence-prevention policies; quality of interaction of administration with faculty, staff, students, and parents or guardians; provision of adequate resources; and emphasis on assurance of a climate to optimize morale.

Occupational violence has been associated with diminished efficiency and reduced productivity, increased turnover, absenteeism, counseling costs, decreased staff morale, and reduced quality of life.[33] Thus, the importance of this issue is heightened, given the national shortage of educators, particularly in fields where they have increased risks in specialty areas.

Limitations

While there was a potential for biases, including the fact that participants self-reported violent experiences and relevant exposures, numerous strategies were implemented to reduce these biases and enhance the overall quality of this study. To decrease information bias, recall of violent events was limited to the previous 12 months, while recall of exposures was limited to a 1-month period within the preceding year—approaches that had been utilized successfully in previous studies.[9,10,34,35] In addition, educators were also followed up by mail to provide missing information, or clarify ambiguous or unclear information, as necessary; to stimulate recall, calendars with relevant holidays were included in survey mailings. Validation sub-studies, pertinent to environmental exposures and health care treatment, were conducted to determine potential measurement error. As described earlier, potential response bias was controlled by inversely weighting observed responses by probabilities of response, estimated as a function of characteristics available from the licensing database.[12] To account for unknown eligibility among nonrespondents, probability of eligibility was estimated from these same factors.[13] Selection of confounders for multiple logistic regression models, to reduce the effect of confounding, was based on DAGs, derived from an overall causal model, following the methods described by Greenland et al.[17]

Because all self-reported surveys are limited in the amount of data that can be collected, based on limited resources and concerns about participant burden, bias may exist from excluding potential confounders that were not identified in the original causal model. Results of the sensitivity analysis indicated that the addition of special education expenditures for the 755 schools, which had this information, did not particularly affect the strength of the association between special education as a primary professional activity and PA; addition of this variable resulted in a reduction in the odds ratio of less than 3%. This is an example of a variable that was not collected for the original model and did not greatly change the outcome of our model. This type of sensitivity analysis can be replicated as additional previously unmeasured confounders are identified.

CONCLUSIONS

This study is among the first such comprehensive efforts to identify the magnitude of the violence problem and potential risk factors among educators. Annual PA and NPV rates per 100 educators (8.3 and 38.4), considered to be conservative, are particularly of concern, given the residual symptoms and feelings experienced for at least a month by 21% to 24% of the PA cases and 35% of the NPV cases. Of further concern are the work changes that resulted among PA (13% to 20%) and NPV (22%) victims. Important also are the risks for educators that were identified on the basis of years and amount of teaching, educational level and specialty preparation, class sizes, perceived impairment of students, grade levels, and types of schools in which they worked. Results of this effort provide unique opportunities for further in-depth investigation of key risk factors identified and the most appropriate methods for controlling these factors through intervention efforts. Knowledge of these risks is important not only to the educators but also to the administrators who have a responsibility for maintaining a safe working environment and can facilitate targeted intervention efforts for at-risk groups. This will be essential to ensure retention of the best educators and ensure quality education in primary and secondary schools.

ACKNOWLEDGMENTS

Support for this study was provided, in part, by the National Institute for Occupational Safety and Health, Centers for Disease Control and Prevention, Department of Health and Human Services (R01 OH007816); 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 also thank their Educational Advisory Consulting team members for their support, who were integral to this study: Willarene Beasley, Charles Goodwin, Donald Hilts, Laura R. Langhoff, and Joseph P. Miller.

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