

ORIGINAL ARTICLE

Relation between policies and work related assault: Minnesota Nurses' Study

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Aims: To assess the relation between violence prevention policies and work related assault.

Methods: From Phase 1 of the Minnesota Nurses' Study, a population based survey of 6300 Minnesota nurses (response 79%), 13.2% reported experiencing work related physical assault in the past year. In Phase 2, a case-control study, 1900 nurses (response 75%) were questioned about exposures relevant to violence, including eight work related violence prevention policy items. A comprehensive causal model served as a basis for survey design, analyses, and interpretation. Sensitivity analyses were conducted for potential exposure misclassification and the presence of an unmeasured confounder.

Results: Results of multiple regression analyses, controlling for appropriate factors, indicated that the odds of physical assault decreased for having a zero tolerance policy (OR=0.5, 95% CI 0.4 to 0.8) and having policies regarding types of prohibited violent behaviours (OR=0.5, 95% CI 0.3 to 0.9). Analyses adjusted for non-response and non-selection resulted in wider confidence intervals, but no substantial change in effect estimates.

Conclusions: It appears that some work related violence policies may be protective for the population of Minnesota nurses.

Over 600 work related homicides occurred in the USA during 2002 alone, and it is estimated that approximately 1.7 million non-fatal acts of violence occurred at work annually between 1993 and 1999.^{1,2} Workers in certain occupations, including nursing, are at increased risk of non-fatal work related assault.³⁻⁸ Primarily, descriptive studies have been used to identify the prevalence of violence focused on particular facilities, units, or sub-groups of nurses; however, it is difficult to compare these data when definitions of violence, study populations, and study periods differed. Estimates range from 87% of staff being assaulted five times per year⁹ to 57% of staff per year,¹⁰ with numerous studies reporting percentages in between.

Currently, there is no mandate, only recommendations, from the federal Occupational Safety and Health Administration (OSHA) regarding work related violence prevention measures. In 1996, OSHA published *Guidelines for preventing workplace violence for health care and social service workers*.¹¹ These guidelines are advisory in nature, neither standards nor regulations. The recommendations state that employers should create "a clear policy of zero-tolerance for workplace violence, verbal and non-verbal threats, and related actions".¹¹ Few data exist to support recommendations from many researchers and OSHA to implement policies;¹¹⁻²¹ therefore, evaluation of these recommendations is necessary.

It is unclear how many organisations have policies regarding work related violence.²²⁻²⁵ However, simply having a violence prevention policy does not ensure a safe work environment.^{24,25} What is included within a violence prevention policy varies by institution. Some authors have recommended a "zero-tolerance policy",^{11,26-30} while others cautioned against its use^{31,32} with the argument that zero tolerance policies are inflexible, and that legal problems are created if an institution does not consider a penalty appropriate for the particular offence. However, even definitions of "zero tolerance" may vary. Wilkinson³³ defined zero tolerance to mean that violence at work was unacceptable, but not that specific predetermined consequences were necessary.

There are very few studies reporting on the impact of policy. Runyan and colleagues³⁴ critically reviewed published literature on administrative and behavioural interventions regarding work related violence and found that, overall, the research designs were weak and results were inconclusive. Among the studies, the types of violence prevention policies varied greatly. Researchers have reported primarily positive policy effects such as: increased awareness of risk situations for violence, avoiding dangerous situations, and improvements in dealing with aggressive patients at worksites where an intervention programme was introduced;³⁵ decreased number of violent incidents after policy implementation;^{36,37} and decreased assault rates after programme implementation.³⁸ However, only one study used a multivariate, case-control approach, and reported a protective effect of policies.⁶ The others have been primarily descriptive, with no control for other exposures.

Based on this limited literature, it is clear that there is a need to evaluate further the impact of work related violence prevention policies on physical assault. While descriptive studies may suggest potential risk factors, it is not possible to estimate the specific risk without a well designed analytic effort with rigorous measurement of relevant exposures. Without such an effort, the development of appropriate and efficacious prevention and control strategies cannot be initiated. The purpose of this study was to assess the relation between violence prevention policies and work related physical assault.

METHODS

This study was based on data collected for the Risk Factors for Violence Among Nurses (RFVAN)³⁹ study, designed to estimate the extent of, and to identify specific risk factors for work related violence. Prior to implementation of this effort, approval was received from the University of Minnesota Institutional Review Board, Human Subjects Committee.

Target population

The target for this study was the population of Minnesota nurses, licensed as of 1 October 1998. At that time, there were

an estimated 79 128 licensed nurses in the state (57 388 registered nurses; 21 740 licensed practical nurses), according to the State of Minnesota Mailing List Service.⁴⁰ Besides name, licence type, and address, the state database included birth date, gender, and year of first licensure.

Data collection

The RFVAN study consisted of two phases: a comprehensive study (Phase 1), and a nested case-control study (Phase 2). Following a pilot study of 220 nurses, a specially designed survey was sent to a random sample ($n = 6300$) from the population of Minnesota nurses (Phase 1). This survey enabled identification of those who worked as nurses in Minnesota in the past year and, among them, those who experienced work related violence during that time. Work related violence was defined as the intentional use of physical force or emotional abuse, against an employee, that resulted in physical or emotional injury and consequences. This included physical assault, threat, sexual harassment, and verbal abuse. The current study focuses specifically on the outcome of physical assault, defined as when one was slapped, kicked, pushed, choked, grabbed, sexually assaulted, or otherwise subjected to physical contact intended to injure or harm.

A nested case-control design was utilised in Phase 2 to examine the relation between exposures and work related physical assault. Through the case-control survey, data were obtained on various factors, including personal exposures (for example, patient contact hours), environmental exposures (for example, work related violence prevention policies, type of department), and characteristics of others in the environment. Cases were surveyed about their exposures for the month prior to and during the assault. Unmatched controls were randomly selected to describe exposures from all months worked by nurses during the study period (the 12 months prior to the date the nurse completed the survey), but prior to any physical assaults for each nurse. This sampling method was to ensure that the distribution of sampled months represented the distribution of months worked.

For each phase, as many as four follow up mailings were implemented to optimise the response rate. Data relevant to the policy implications from the case-control study were the primary focus of this study.

Case and control definitions

Cases ($n = 475$) were defined as those nurses who reported at least one episode of physical violence in the previous 12 months. If multiple events of physical violence were reported by the same nurse, the participant was asked questions regarding the most remote event. Unmatched controls ($n = 1425$) were selected in a 3:1 ratio to cases from

among those who reported no physical assault. Cases were also eligible to be chosen as controls during the months prior to their first assault.

Policy definitions

Nurses were asked about eight different policy components: "Prior to (specific month), did your facility/institution/agency have a written policy on violence that addressed any of the following: (a) 'zero tolerance' for violence, that is, violence was not tolerated at any level; (b) types of violent behaviours (physical assault, threat, sexual harassment, or verbal abuse) that were prohibited; (c) consequences for those who used violence at work; (d) how to report if someone sexually harassed, threatened, or verbally abused you; (e) how to report if someone physically assaulted you; (f) assurance that reporting of violent incidents would be kept confidential; (g) requirements for violence prevention training of staff members; and (h) requirements for flagging of charts or other signals to staff members regarding patients/clients with repeated violent behaviour?" Response options included yes, no, and unsure. They were then asked the degree to which policy components were enforced.

Analysis

A comprehensive diagram representing causal relationships was used to depict variables included in the data collection instruments; a directed acyclic graph derived from the diagram also served as a basis for analyses, selection of confounders for multiple logistic regression, and for interpretation of results.⁴¹ A portion of this causal diagram is shown in fig 1. Univariate analyses, using SAS version 8.02, were performed first to describe the characteristics of individual exposures. Once the directed acyclic graph, based on the causal model was established, it was used to determine which variables should be included as possible confounders when studying the exposures of interest: work related violence policy components. These methods are based on those presented by Greenland and colleagues,⁴¹ and Maldonado and Greenland,⁴² and as illustrated by Hernan and colleagues.⁴³ The variables in the sufficient set of confounders were the minimum required to block all "back-door pathways" (potentially confounding relationships) from the exposure of interest (policy) to the outcome (work related physical assault). To avoid a potential source of bias in the analysis, variables that were located in the causal pathway between the exposure of interest and the outcome were not included in the model. Multiple logistic regression⁴⁴ was used to investigate the relation between specific exposures and the occurrence of work related violence.

Potential response bias was controlled by inversely weighting responses by probabilities of response estimated as a function of characteristics available from the licensing database (age, gender, licence type, home address (metropolitan area versus non-metropolitan area)).⁴⁵ To control for unknown eligibility among non-respondents, each non-respondent was down-weighted by the estimated probability of ineligibility among nurses with the same characteristics.⁴⁶ To represent variability from all sources, confidence intervals for regression coefficients were calculated by using the bootstrap method.⁴⁷

Employer validation sub-study

A sub-study was conducted to validate nurse responses regarding specific work characteristics, including written work related violence prevention policies, by comparing responses between nurses and employers. For this sub-study, letters were sent to a random sample of nurses (135 cases and 135 controls), requesting the names of their employing institutions. A subset of the questions pertinent to policies, to

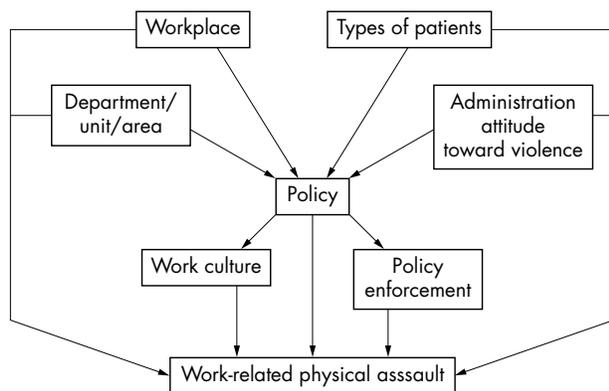


Figure 1 Work related assault: impact of policy causal model.

Table 1 Work related assault: impact of policy participant characteristics

	Cases (n = 310)		Controls (n = 946)	
	n	%	n	%
Practice type				
RN	213	68.7	701	74.1
LPN	97	31.3	245	25.9
Gender				
Female	293	94.5	910	96.2
Male	17	5.5	36	3.8
Age				
<30	22	7.1	54	5.7
30 to <40	60	19.4	134	14.2
40 to <50	121	39.0	372	39.3
50 to <60	79	25.5	288	30.4
60 or older	28	9.0	98	10.4
Nursing education				
Diploma	120	38.7	361	38.2
Associate degree	118	38.0	259	27.4
Bachelor's degree	66	21.3	253	26.7
Master's degree or higher	4	1.3	59	6.2
Missing	2	0.7	14	1.5
Primary patient population				
Geriatric	144	46.5	206	21.8
Adult	110	35.5	416	44.0
Split time	43	13.9	191	20.2
Neonatal/paediatric/adolescent	13	4.2	128	13.5
Missing (refused)	0	0.0	4 (1)	0.4 (0.1)
Primary professional activity				
Provided patient care	210	67.7	588	62.2
Supervised patient care	49	15.8	72	7.6
Other	51	16.5	285	30.1
Missing	0	0.0	1	0.1
Type of facility				
Nursing home/long term care/ rehabilitation facility	143	46.1	160	16.9
Hospital inpatient	131	42.3	384	40.6
Hospital outpatient/non-hospital outpatient	11	3.5	83	8.8
Clinic/healthcare provider office	9	2.9	119	12.6
Other	16	5.2	199	21.0
Missing	0	0.0	1	0.1
Department/unit/area				
Long term/assisted care	123	39.7	145	15.3
Medical/surgical/ob gyn	71	22.9	267	28.2
Psychiatric/behavioural	34	11.0	57	6.0
Intensive care unit	27	8.7	65	6.9
Emergency	12	3.9	24	2.5
Other	43	14.0	386	40.8
Missing (refused)	0	0.0	1 (1)	0.1 (0.1)

which the nurses had already responded through the case-control survey, was subsequently posed to the employers without identification of the nurse employee study participants.

RESULTS

Of the 6300 nurses randomly selected for Phase 1, 79% responded; 80% of respondents worked in nursing positions in the previous 12 months, and 13.2% indicated they experienced work related physical assault in the past year. Phase 2, the nested case-control study, included 1900 nurses (overall response = 75%; response for full surveys = 67%). Because patients perpetrated nearly all of the reported physical violence, the analyses presented here focused only on patient perpetrated violence (cases = 310; controls = 946).

Characteristics of the case-control participants are presented in table 1. Cases and controls were predominately registered nurses, female, and 40–59 years of age. Most frequently, the highest nursing degree was a diploma for both cases and controls. Cases most frequently reported working in a nursing home or long term care facility, while controls worked primarily in a hospital inpatient facility. Cases also worked most frequently with a primarily geriatric population, while controls worked with non-geriatric adults. The primary

professional activity for both cases and controls was most often reported as providing patient care; most cases worked primarily on long term or assisted care units, while controls worked on medical or surgical units.

Respondents reported institutional written policies that, among others, addressed zero tolerance for violence and prohibited types of violent behaviours (table 2). The proportions of nurses who reported being unsure of whether or not policies existed ranged from 10% to 33% for cases and 15% to 32% for controls. When nurses were asked to what degree these policies were enforced, they most frequently stated “unsure”. However, a greater proportion of the controls than cases perceived policies to be “always enforced” (20% of controls compared with 15% of cases).

Zero tolerance policies were most frequently reported by nurses working in outpatient and “other” facilities, such as schools, insurance, industry, and others. Prohibited behaviour policies were most frequently reported in inpatient hospitals, outpatient facilities, and “other” facilities. Policies regarding consequences for those using violence were most frequently reported in long term care and “other” facilities, as were policies for reporting non-physical violence, and assurance that reporting would be kept confidential. Policies on how to report physical assault were most frequently

Table 2 Work related assault: impact of policy types of policy components reported

Policy component	Cases (n = 310)		Controls (n = 946)	
	n	%	n	%
Zero tolerance policy				
Yes	116	37.4	498	52.6
No	90	29.0	141	14.9
Unsure	102	32.9	305	32.2
Missing (refused)	1 (1)	0.3 (0.3)	2	0.2
Types of violent behaviours that were prohibited (physical assault, threat, sexual harassment, or verbal abuse)				
Yes	204	65.8	690	72.9
No	53	17.1	80	8.5
Unsure	61	16.5	174	18.4
Missing (refused)	1 (1)	0.3 (0.3)	2	0.2
Consequences for those who were violent at work				
Yes	195	62.9	587	62.1
No	37	11.9	90	9.5
Unsure	75	24.2	264	27.9
Missing (refused)	2 (1)	0.6 (0.3)	2	0.2
How to report if someone sexually harassed, threatened, or verbally abused you				
Yes	252	81.3	741	78.3
No	24	7.7	66	7.0
Unsure	32	10.3	137	14.5
Missing (refused)	1 (1)	0.3 (0.3)	2	0.2
How to report if someone physically assaulted you				
Yes	251	81.0	713	75.4
No	26	8.4	70	7.4
Unsure	31	10.0	161	17.0
Missing (refused)	1 (1)	0.3 (0.3)	2	0.2
Assurance that reporting of violent incidents would be kept confidential				
Yes	168	54.2	553	58.5
No	53	17.1	122	12.9
Unsure	87	28.1	269	28.4
Missing (refused)	1 (1)	0.3 (0.3)	2	0.2
Requirements for violence prevention training of staff members				
Yes	118	38.1	349	36.9
No	122	39.4	360	38.1
Unsure	68	21.9	235	24.8
Missing (refused)	1 (1)	0.3 (0.3)	2	0.2
Requirements for flagging of charts or other signals to staff members regarding patients/clients with repeated violent behaviour?				
Yes	68	21.9	205	21.7
No	203	65.5	452	47.8
Unsure	37	11.9	287	30.3
Missing (refused)	1 (1)	0.3 (0.3)	2	0.2

reported at long term care and inpatient facilities. Inpatient and outpatient facilities were most frequently reported as having violence prevention training required by policy. Policies regarding flagging charts of violent patients were most frequently reported by those working in long term care facilities.

When stratified by facility type, some policies had significance values of $p < 0.05$ when comparing cases and controls, indicating a potentially protective effect of policies. These included the following: zero tolerance policies ($p < 0.01$), prohibited behaviour policies ($p < 0.02$), how to report physical assault ($p < 0.01$), and policies regarding flagging charts at inpatient hospitals ($p < 0.01$); policies regarding flagging charts at long term care facilities ($p = 0.01$); zero tolerance policies in outpatient facilities ($p < 0.01$); and assurance of confidentiality in reporting

($p = 0.03$) and policies on prohibited violent behaviours ($p < 0.01$) at clinic/healthcare provider offices.

Analyses at the univariate and multivariate levels are shown in table 3. At the univariate level, presence of a zero tolerance policy and policies on prohibited types of behaviours were associated with decreased odds of physical assault. Policies on confidentiality of reporting and flagging of charts of patients with repeated violent behaviour appeared suggestive as protective factors. Based on the comprehensive causal model, the multivariate model (Model 2) adjusted for numerous factors, and again, found zero tolerance policies and policies regarding types of prohibited violent behaviours as protective against assault. However, as shown in Model 3, after adjusting for non-response and non-selection of controls, this effect appeared to decrease for both types of policies.

Table 3 Work related assault: impact of policy logistic regression models

Policy component	Model 1		Model 2		Model 3	
	OR	95% CI	OR	95% CI	OR	95% CI
Zero tolerance	0.37	0.26 to 0.51	0.54	0.35 to 0.84	0.70	0.38 to 1.51
Types of prohibited behaviours	0.45	0.31 to 0.65	0.54	0.33 to 0.90	0.56	0.32 to 1.43
Confidentiality in reporting	0.70	0.49 to 1.01	0.83	0.50 to 1.38	1.05	0.54 to 2.76
Flagging charts	0.74	0.54 to 1.02	0.76	0.50 to 1.14	0.66	0.39 to 1.30
Consequences for using violence at work	0.81	0.53 to 1.22	0.97	0.56 to 1.71	1.201	0.50 to 2.94
How to report non-physical violence	0.94	0.57 to 1.52	1.01	0.53 to 1.92	1.70	0.57 to 4.53
How to report physical violence	0.95	0.59 to 1.52	0.70	0.36 to 1.34	0.82	0.35 to 3.02
Required training policies	1.00	0.74 to 1.34	0.93	0.63 to 1.37	1.11	0.62 to 1.93

Model 1: Univariate.

Model 2: Multivariate: adjusted for: *Workplace* [type of facility (Q1), ownership of facility (Q2), location of facility (Q3), total beds at facility (Q4)], *Administration attitude* [administration's expectation of violence (Q24A), administration's corrective measures against violence (Q24B)], *Department/unit/area* (Q8), and *Types of patients* [age of population (Q5), race of patients (Q12A), patient gender (Q12B), patient mental status (13B), average length of patient stay (Q15)].

Model 3: Adjusted and weighted multivariate: adjusted for all variables in Model 2, and also non-response and non-selection.

In addition to the descriptive and multivariate analyses, additional analyses were conducted regarding validity and bias. For the employer sub-study, 49% (cases = 63; controls = 69) of the nurses provided the name and address of their employers. Of the 64 employers who responded to this sub-study, and for which there were data reported by the nurse, the percentage agreement (employer and nurse either both answered "yes" or both answered "no") regarding written violence prevention policies varied from 34% agreement about zero tolerance policies and requirements for training of staff members to 75% agreement about policies on how to report work related non-physical violence (table 4). Those completing the employer survey also indicated being unsure of policy existence in some instances, which varied from 2% for reporting non-physical violence to 16% regarding a policy requiring violence prevention training for staff members. χ^2 analyses revealed no important differences between cases and controls when compared with employers' responses.

DISCUSSION

While violence prevention policies are often recommended to address work related violence,¹²⁻²¹ no clear evidence of the efficacy of such policies has been presented. This study was unique in that it enabled identification of the potential effect of violence policies on work related assault in the population of Minnesota nurses.

At the univariate level, all types of policies resulted in decreased risks; two of these (zero tolerance and types of prohibited behaviours) had 95% confidence intervals excluding 1. These results are in agreement with those reported by Lee and colleagues.⁶ Through the use of a comprehensive causal model,⁴¹ multivariate logistic models were constructed to evaluate the impact of policy on work related physical assault. After controlling for relevant variables, zero tolerance policies and policies regarding types of prohibited behaviours again emerged as being important. These findings are similar

to conclusions suggested by others.^{11 26-30} Additional multivariate logistic regression models were completed for each policy type, and weighted for non-response and non-selection.⁴⁶ Although four policy types remained suggestive of being protective, none were important at this level of analyses.

Eight components of violence prevention policies were studied in this research effort. While a sizable proportion of nurses reported being unsure whether or not policies existed (cases, 10-33%; controls, 15-32%), other studies have reported even higher percentages (>50%) for this uncertainty.^{24 25} This limits the ability to evaluate the impact of policies, and raises questions about the effectiveness of organisational communication of policies and procedures. Also in this study, it was not possible to differentiate the enforcement of each type of policy, only the overall enforcement of all types of violence prevention policies. This may dilute the effect that can be estimated from policy enforcement. However, this study did enable estimation of the policy prevalence and overall enforcement of violence prevention policies, data that are currently unavailable in the literature.

In addition to the descriptive, univariate, and multivariate analyses, additional analyses were conducted regarding validity of the study results. The employer sub-study revealed that, among four of the seven components of policies that were assessed, the percentage agreement between the nurse and the employer, regarding the presence of the policy, was 50% or greater; two types of policies (how to report physical and non-physical violence) had greater than 70% agreement. Some disagreement between employer and nurse responses may be related to the role of the person completing the employer survey, which varied greatly: for example, consultant physician; security manager; shift supervisor; administrator; chief executive officer; employees in these positions may have very different levels of knowledge regarding institutional policies.

Table 4 Work related assault: impact of policy employer sub-study policy existence agreement between nurse and employer

Type of written policy component	Case match (n = 36 nurses)	Control match (n = 28 nurses)	Total (n = 64 nurses)
How to report if someone sexually harassed, threatened, or verbally abused you	75%	75%	75%
How to report if someone physically assaulted you	75%	71%	73%
Consequences for those who used violence at work	56%	64%	59%
Types of violent behaviours that were prohibited (physical assault, threat, sexual harassment, or verbal abuse)	56%	68%	61%
Assurance that reporting of violent incidents would be kept confidential	39%	54%	45%
Requirements for violence prevention training of staff members	31%	39%	34%
Zero tolerance policy	28%	43%	34%

Main messages

- Work related violence is a significant problem for the population of Minnesota nurses.
- It appears that certain types of policies, specifically zero tolerance policies, and those addressing prohibited types of behaviours, may be protective for this population.
- Many nurses reported being “unsure” of policy existence; therefore, this study is only the first step in understanding the impact of policies on work related violence. Future research would benefit from physical review of work policies, or a study design in which policy existence is known.

The employer sub-study did not appear to be a gold standard for comparison with nurses’ responses. Even those completing the employer survey were unsure of some policies’ existence. Essentially, the overall study focused on the nurses’ perceptions of policies—that is, whether or not the policies actually existed; the employer sub-study compared the nurses’ perceptions that written policies existed with the perception of the existence of these policies by the person completing the employer survey. Future studies would ideally include a validation measure comparing nurses’ perceptions to a physical review of policies obtained from employers to estimate the degree to which perception may vary from fact.

Organisational culture may have a significant impact on behaviours, regardless of the existence of policies. If a nurse interprets the employer’s attitude as having a low tolerance to violence, behaviours may be adjusted accordingly; the opposite is also true—having a zero tolerance policy without management commitment may indicate little about the true impact of policies. Policies cannot stand alone; a strong commitment by management and administration must support the policies.¹¹ Lord²⁴ found that some employees reported little change in work related violence, even if the employee followed the employer’s policy. From the current effort,²⁴ it was reported that over 51% of the victims of work related violence felt administration did not respond to the incident; according to 53% of the victims, nothing was done to resolve the situation, and 57% reported that nothing was done to prevent the incident from happening again.

It is possible that cases may provide better exposure information (differential recall), because they have an event to which exposures can be related; this may vary with controls, who are recalling exposures during a particular month, without having a specific reference event. Sensitivity analyses were conducted to estimate the effect of an unmeasured confounder and exposure misclassification on two types of policies: zero tolerance and types of prohibited violent behaviours policies. In most cases, even after adjusting for a strong unmeasured confounder, both types of policies remained protective, except when paired with extreme differences in the prevalence of the strong unmeasured confounder, where the odds of violence were slightly increased. Similarly, when assessing the effect of exposure misclassification, both types of policies continued to appear protective, except for the rare instance with extreme misclassification error when assessing the impact of zero tolerance policies. Exposure misclassification and/or an unmeasured confounder would have to be extreme to result in changes in the interpretation of the data.

Policy implications

- The presence of policies, alone, cannot protect workers from violence, as many employees are unsure of policy existence.
- Following a better understanding of the impact of violence prevention policies, and specific risk factors for violence, policies on violence and work methods may be implemented to decrease the incidence of work related violence.

Conclusions

Work related violence prevention policies are often recommended as part of a comprehensive approach to address occupational violence; however, empirical literature to support these recommendations has been lacking. Certain types of violence prevention policies, specifically zero tolerance policies and policies that address types of prohibited violent behaviours, appear protective in this population of Minnesota nurses. Work related violence is a serious problem, and this study is an important first step in determining the impact of violence prevention policies.

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