Journal of Safety Research 44 (2013) 57–64

Contents lists available at SciVerse ScienceDirect

Journal of Safety Research

journal homepage: www.elsevier.com/locate/jsr

Perpetrator, worker and workplace characteristics associated with patient and visitor perpetrated violence (Type II) on hospital workers: A review of the literature and existing occupational injury data☆

Lisa Pompeii *, John Dement, Ashley Schoenfisch, Amy Lavery, Megan Souder, Claudia Smith, Hester Lipscomb

The University of Texas, School of Public Health, 1200 Herman Pressler, RAS E617, Houston, Texas 77030, USA

ARTICLE INFO

Available online 30 November 2012

Keywords:
Workplace violence
Violence
Hospital workers
Surveillance
Type II violence

ABSTRACT

Problem: Non-fatal type II violence experienced by hospital workers (patient/visitor-on-worker violence) is not well described. *Methods:* Hospital administration data (2004-2009) were examined for purposes of calculating rates of type II violent events experienced by workers. We also conducted a review of the hospital-based literature (2000-2010) and summarized findings associated with type II violence. *Results:* 484 physical assaults were identified in the data, with a rate of 1.75 events/100 full-time equivalents. Only few details about events were captured, while non-physical events were not captured. The literature yielded 17 studies, with a range proportion of verbal abuse (22%–90%), physical threats (12%–64%) and assaults (2%–32%) reported. The literature lacked rigorous methods for examining incidence and circumstances surrounding events or rates of events over time. *Discussion:* For purposes of examining the impact of type II violence on worker safety, satisfaction and retention, rigorous surveillance efforts by hospital employers and researchers are warranted.

1. Problem

Workplace violence perpetrated by patients and visitors towards hospital staff (Type II violence) has received increased attention in recent years; however, this workplace issue is not new. In 1985, Jones reported that among hospital staff at a Veterans Administration Hospital, nurses' aides and nurses reported that the majority of injuries were due to workplace violence, and patients were more likely to be the perpetrator of these assaults. More recently, a large cross-sectional study of nurses working in various health care settings in Minnesota reported rates of physical assault by patients and visitors as high as 13.2 per 100 person-years of work (Gerberich et al., 2005).

Despite the publication of numerous studies over the past two decades, little is known about the risk factors of Type II violence in the hospital setting, as well as rates of violence and changes in these rates over time. In 2001, a report by a team of violence research experts highlighted the lack of informative data pertaining to nonfatal workplace violence relative to the "enormous scope of the problem" (Merchant & Lundell, 2001; Peek-Asa, Runyan, & Zwerling, 2001). The implementation of coordinated surveillance efforts of nonfatal workplace violence for purposes of creating prevention programs based in scientific evidence was encouraged.

The purpose of this study was to identify risk factors of Type II violence experienced by hospital workers and to describe what is known about these events including: (1) perpetrator characteristics; (2) worker characteristics; (3) circumstances surrounding violent events; (4) potentially relevant work environment factors; (5) warning signs; and (6) consequences experienced by workers who were victims of Type II violence. These elements were identified through a systematic review of the literature, as well as analysis of existing administrative data among hospital workers employed in three study hospitals. Findings from these analyses will be used to inform the development of an online hospital violence surveillance system aimed at capturing circumstances surrounding these types of events from workers, which is part of a larger, ongoing study.

2. Methods

These data were collected through a systematic review of the literature and analyses of reported Type II violent events among workers at a major university medical center and two community hospitals that are part of the same health system.

2.1. Existing worker injury reports

Data sources: Data for these analyses came from the Duke Health and Safety Surveillance System (DHSSS) (Dement et al., 2004), that includes occupational data for employees in the Duke University Health System (DUHS) which includes a tertiary care academic medical center and two community hospitals. Events of interest for these analyses originated from three different potential sources including reported

☆ This study was funded by the National Institute for Occupational Safety and Health (NIOSH) Grant No. R01 OH009697.

* Corresponding author.

0022-4375/$ – see front matter
http://dx.doi.org/10.1016/j.jsr.2012.09.004

workers' compensation claims, Occupational Safety and Health Administration (OSHA) logs, and the hospitals' Safety Reporting System (SRS). SRS is an online voluntary reporting system where workers can report any safety concerns related to patients, visitors, clinicians or employees regardless of whether the event resulted in an injury.

Administrative data from Human Resources were used to define the study population at risk. Workers were included if they: (1) contributed work hours during years 2004 through 2009; (2) worked as a nurse, nurses' aide, clinical technical worker (with the exception of those working in the morgue or animal handling facility), police officer or security worker; and (3) worked in one of the three health system hospitals. For each worker, time at risk was estimated each year using available data on their work schedules (hours/week) and months employed during a given study year. Time at risk was defined as the number of full-time equivalents (FTE), where 1 FTE = 2,000 hours worked. Injury surveillance and Human Resources data were de-identified and linked at the individual worker level for analyses.

Six years (2004 through 2009) of workers' compensation (WC) claims, incident reports in the Safety Reporting System (SRS), and OSHA logs were used to capture and characterize Type II violence events. Events were identified through a review of all text descriptions provided in each of these data sources. Initially, injury events were flagged if the text description contained a keyword(s) suggesting a violent event. Keywords were similar to those used to identify physical assaults in previous research using DHSSS data (Rodríguez-Acosta et al., 2010), and included patient/visitor characteristics (e.g., "confused," "combative," "disoriented"), patient/visitor actions toward staff (e.g., "scratch," "kick," "bite," "grab," "pull"), and staff actions toward the patient/visitor (e.g., "restrain," "struggle"). The flagged events were then manually reviewed and events were retained if they pertained to Type II violence. If an event was present in multiple data sources, it was counted as a single event.

Data Analysis: Violent events were described in terms of the cause, nature, and body site of injury, which are existing codes in WC. Similar codes were assigned for the claims from SRS and the OSHA log based on information available in text descriptions of the events. Events were characterized by whether they resulted in days away from work (for events in WC or OSHA logs only) and/or received medical care. Event text descriptions were also used to gather additional event details, including the perpetrator (i.e., patient, visitor) and their characteristics, patient/visitor actions toward staff, staff actions toward the patient/visitor and characteristics of the patient/visitor.

The study cohort was described in terms of the number of workers, time at risk and frequency of work-related Type II violent events overall, over time and by worker gender, age, race, institutional tenure, occupational group and work location. The overlap of reported events between the three reporting systems was described. Violent events were described by occupational group. Crude rates, rate ratios (RR) and 95% confidence intervals (CI) were estimated using Poisson regression, with the natural log of full-time equivalents as the offset.

2.2. Review of the literature

Inclusion/exclusion criteria: A known limitation of the literature is the inconsistency with which Type II violence has been defined ranging from verbal threats, physical threats, and/or physical assault including sexual assault. Since no definition has been broadly accepted or applied we chose not to restrict our review to any one definition. We included peer-reviewed studies that (1) addressed Type II violence experienced by any type of worker in the hospital setting; (2) were written in English; and (3) were published from January 2000 through February 2010. We excluded studies conducted in other healthcare settings such as nursing homes and psychiatric hospitals. If a study examined Type II violence in various healthcare settings and presented findings specific to workers in the hospital setting, the article was included. Similarly, if a study examined various types of workplace violence (e.g., worker-on-worker violence/ Type III), but presented analyses stratified by Type II violence, the article was included. References were excluded that were tagged as anonymous, letters or editorials.

Search terms: The search terms used in OVID Medline included: (1) violence, violent assault, assault; (2) occupational health, occupational exposure, occupational accidents, workers' compensation, safety management, safety; (3) hospital personnel, health personnel, nurses, physicians, doctors, housekeepers, dieticians, pharmacists, orderlies, technicians, therapists, emergency department, professional-patient relations, nurse-patient relations, physician patient relations; (4) hospitals, general; hospitals, group practice; hospitals, packaged; hospitals private; hospitals, teaching; hospitals, rural; hospitals, satellite; hospitals, urban; hospital units; hospital departments; (5) English. Initially, we conducted a review of article titles and abstracts and excluded those that did not meet the 5 criteria stated above.

For articles that were not discernible from the title and abstract, as well as articles that met the criteria, we conducted a full-text article review. We chose to include studies that reported a mix of Type II and Type III (worker-on-worker) violence where the prevalence of Type III violence was small (~10%) relative to Type II. During the full-text review we chose to further exclude studies that met our study criteria, but had fewer than 150 observations. Upon review of these studies, we observed that a large proportion did not provide details pertaining to worker or workplace characteristics associated with Type II violence, and for those that did the cell sizes were small.

All procedures were approved by the Institutional Review Boards at The University of Texas Health Science Center at Houston and Duke University Medical Center.

3. Results

3.1. Review of existing worker injury reports from the DHSSS

The study cohort was made up of 12,804 workers who contributed a total of 27,681 full-time equivalents over the 6-year study period. Most of the workers were female (82%). White and Black/African American were the more common racial groups represented (68% and 24%, respectively). By occupation, inpatient nurses contributed the most FTEs (51%), followed by clinical technical/professional workers (36%), nurses' aides (10%) and public safety workers (3%).

A total of 484 work-related Type II violent events were identified from 2004 through 2009 in at least one of the three data systems (Table 1). All of these events were patient-perpetrated (i.e., no visitor-perpetrated events were reported). The 484 events were reported by 458 workers; 25 workers reported more than 1 event.

The Safety Reporting System (SRS), Workers' Compensation, and OSHA log, all incorporated within the DHSSS, have different case definitions and reporting requirements. Among the three reporting systems, the highest proportion of the events was captured by the WC system (82%, n = 399/484). Only 40 events (8%) were reported in more than one data system. Notably, for the years 2004 through 2006, only 6% of the reported events were identified in the SRS or the OSHA log, compared to 27% in 2007 through 2009. No events were captured by all three systems during the study period. Of the 422 events identified through WC claims and/or OSHA logs, 2.4% (n = 10) had associated lost work days. These results point to the importance of integrating data across multiple reporting systems using a surveillance system such as the DHSSS in order to capture workplace violence events more thoroughly.

In this study cohort, an overall violent event rate of 1.75 per 100 FTEs (95%CI 1.60-1.91) was observed. Rates of reported violence were higher among males compared to females (RR: 1.27, 95%CI 1.03-1.56) while rates were 50% higher among Black workers compared to Whites (RR: 1.47, 95%CI 1.21-1.79) (Table 1). Rates decreased with increasing age and tenure. By occupational group, higher rates were observed among public safety workers (5.14 events per 100 FTEs) and nursing aides

Table 1
Incidence rates, crude rate ratios and 95% confidence intervals of reported type II violence events over time and by worker demographics, 2004 – 2009.

	FTEs	Number of events	Rate per 100 FTEs	Rate Ratio	95% CI LB	95% CI UB
Year						
2004	4188	64	1.53	1.00		
2005	4326	59	1.36	0.89	0.63	1.27
2006	4517	88	1.95	1.28	0.92	1.76
2007	4669	81	1.73	1.14	0.82	1.58
2008	4871	72	1.48	0.97	0.69	1.35
2009	5110	120	2.35	1.54	1.13	2.08
Gender						
Female	22120	367	1.66	1.00		
Male	5561	117	2.10	1.27	1.03	1.56
Age (in years)						
<30	6005	127	2.11	1.00		
30 to <40	7561	136	1.80	0.85	0.67	1.08
40 to <50	7434	117	1.57	0.74	0.58	0.96
50 to <60	5499	88	1.60	0.76	0.58	0.99
60+	1182	16	1.35	0.64	0.38	1.08
Tenure (in years)						
<5	14982	344	2.30	1.00		
5 to <10	5390	74	1.37	0.60	0.47	0.77
10 to <15	2410	24	1.00	0.43	0.29	0.66
15+	4899	42	0.86	0.37	0.27	0.51
Race						
White	18723	290	1.55	1.00		
Black	6669	152	2.28	1.47	1.21	1.79
Other*	2277	41	1.80	1.16	0.84	1.61

* Includes Hispanic, American Indian or Alaskan Native, Native Hawaiian or other Pacific Islander, Asian.

Table 2
Incidence rates, crude rate ratios and 95% confidence intervals of reported type II violence events by worker characteristics, 2004 – 2009.

	FTEs	Number of events	Rate per 100 FTEs	95% CI LB	95% CI UB
Work location					
University	788	38	4.82	3.51	6.63
Medical Center	18616	294	1.58	1.41	1.77
Community Hospital 1	4871	100	2.05	1.69	2.50
Community Hospital 2	3407	52	1.53	1.16	2.00
Job title					
Public Safety	953	49	5.14	3.89	6.80
Nursing Aides	2779	130	4.68	3.94	5.56
Nursing Inpatient	14119	253	1.79	1.58	2.03
Respiratory Care	828	14	1.69	1.00	2.85
Physical/Occup Therapy	830	13	1.57	0.91	2.70
Radiology & Imaging	2130	15	0.70	0.42	1.17
Other Clinical Tech/Prof	6041	10	0.17	0.09	0.31
Work unit*					
Psychiatry	269	21	7.81	5.10	11.99
Police/Security	887	49	5.52	4.17	7.31
Float pool	1249	56	4.48	3.45	5.82
Emergency	1731	76	4.39	3.51	5.50
Neurology	846	29	3.43	2.38	4.93
Other adult inpatient	5010	122	2.43	2.04	2.91
ICU/CCU	1903	41	2.15	1.59	2.93
Respiratory care	853	15	1.76	1.06	2.92
PT/OT/Rehab	1042	12	1.15	0.65	2.03

* Data not shown for units with rates <1 per 100 FTE: anesthesia, surgery, radiology, pediatrics, women's, social work, pharmacy, parking/transportation.

(4.68 events per 100 FTEs) compared to inpatient nurses (1.79 events per 100 FTEs) and clinical technical/professional workers (Table 2). Work locations with higher rates of violence events included psychiatry, police/transportation, emergency department, float pool, neurology, ICU/CCU and adult medicine.

Patient behaviors were described in 92.2% of the event narratives. More common patient actions toward staff members were hitting (27.1%), scratching (24.8%), grabbing (14.1%), kicking (13.2%), and biting (12.4%). Staff actions toward the patient were described in 5.8% of the event narratives and included restraining (4.6%) or struggling with (1.2%) the patient. Finally, patient characteristics were described in 24.0% of the event narratives. Patients were described as combative (e.g., "combative," "aggressive," "violent," "hostile") in 17.2% of the events. Confused/disoriented was used to describe patients in 3.3% of the events.

3.2. Review of the literature

Our initial search resulted in 2,036 articles, which yielded 17 studies (18 research papers) for the final review. As outlined in Fig. 1, articles were excluded because they were not related to violence (n = 562), not peer reviewed (n = 578), they pertained to violence not related to employment (e.g., domestic violence) (n = 498), they were workplace violence studies conducted in settings other than the acute care hospital (n = 213), they did not present data stratified by Type II violence in the hospital setting (n = 109), and for those studies that did, 39 had sample sizes less than 150 observations. Nineteen articles could not be accessed.

Included Studies: Eighteen research articles addressing 17 studies met the criteria for this review (Table 3), including 4 studies (El-Gilany, El-Wehady, & Amr, 2010; Farrell, Bobrowski, & Bobrowski, 2006;

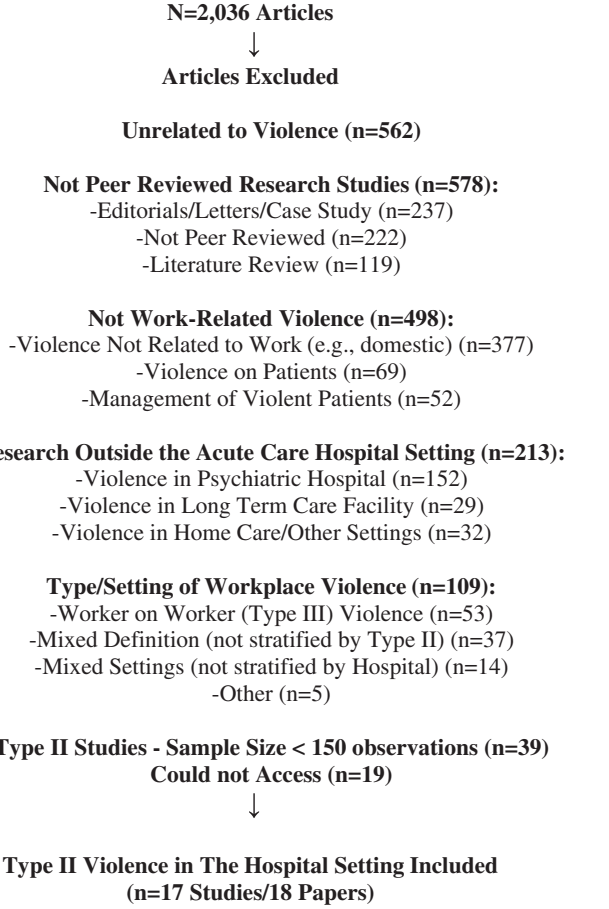

Fig. 1. Systematic Review for Identifying Hospital-Based Type II Violence Studies: January 2000- February 2010.

Table 3
Peer Reviewed Manuscripts Included in the Literature Review (n = 17 Studies).

	Author(s) Year, Country	Study Design	Sample Size	Hospital Dept.	Work Group(s)	Data Collection Methods	Response Rate	Type II Violence Definition	Prevalence Period	Violence Prevalence		
										Verbal Abuse	Threat of Assault	Physical Assault
1	Ayranci et al., 2006, Turkey	CS	1,209	All	All	WS	88%	V,T,P,S	12 mos.	36%		14%
2	Chapman et al., 2009, Australia	CS/QT	113/20	All	RN	MS/FG	34%/31%	NS	12 mos.			
3	El-Gilany et al., 2010, Saudi Arabia	CS	1,091	All	All	WS	96%	V,P	12 mos.	52%	37%	11%
4	Farrell et al., 2006, Australia	CS	2,407	All	NM, RN	MS	38%	V,P	4 weeks	74%		50%
5	Fernandes et al., 2002, Canada	S-CS	217	ED	All	WS	60%-72%	V,P	2 weeks	50%		19%
6	Findorff et al., 2004, 2005, U.S.	CS	1,751	All	All	MS	42%	V,P	12 mos.	13%		7%
7	Gacki-Smith et al., 2009, U.S.	CS	2,456	ED	NM, RN	WB	11%	V,T	36 mos.	70%		50%
8	Gates et al., 2006, U.S.	CS	242	ED	All	WS	40%	V,T,P,S	6 mos.	~84%	~66%	48%
9	Hesketh et al., 2003, Canada	CS	9,174	All	RN	MS	53%/48%	V,T,P,S	Previous 5 shifts			
10	James et al., 2006, U.K.	RR	218	ED	All	RR	NA	V,T,P	12 mos.	90%	52%	32%
11	Kowalenko et al., 2005,U.S.	CS	171	ED	MD	MS	71%	V,T,P	12 mos.	75%	12%	28%
12	Landau & Bendalak, 2007, Israel	CS	2,356	ED	All	WS	79%	V,T,P	12 mos.			
13	Luck et al., 2007, Australia	QT	20	ED	RN	DO/FG	37%	NS	NA			
14	Peek-Asa, Cubbin, & Hubbell, 2002,U.S.	S-CS	198 EDs	ED	All	MS	NS/53%	V,T,P	10 years			
15	Rodríguez-Acosta et al., 2010, U.S.	RC	13,290									
FTEs	All	RN, NA	WC	NA	P	8 years			1.7/100 FTE			
16	Salerno, Dimitri, & Talamanca, 2009, Italy	RR	2,196	Psych	RN, MD	RR	NR	V,P	4 years	7%		12%
17	Winstanley & Whittington, 2004, U.K.	CS	375	All	All	WS	33%	V,T,P	12 mos.	68%	~23%	27%

+ Definition of violence included both Type II and III, but majority of verbal and physical violence events were Type II events
++Definition of violence included both Type II and III, but majority of physical violence events were Type II events
Study Design: CS = cross sectional; QT = qualitative; S-CS = serial cross sectional; RC = retrospective cohort; RR retrospective record review; PC = prospective cohort
Violence Definition: V = verbal abuse, T = threat of violence, P = physical assault, S = sexual assault/harassment
NA = not applicable; NS = not specified FTE = full-time equivalent
Data Collection: WS = survey distributed at work; FG = focus group; MS = mail survey; RR = record review; WC = workers' compensation; WB = web survey; DO = direct observation
Department: All = all hospital units; ED = emergency dept.
Work Groups: RN = nurse; NM = nurse manager; NA = nurses' aide/patient care attendant; MD = physician;
FTEs = Full Time Equivalents.

Fernandes et al., 2002; Findorff, McGovern, Wall, & Gerberich, 2005; Findorff, McGovern, Wall, Gerberich, & Alexander, 2004) that examined both Type II and Type III violence where the prevalence of violence by coworkers was small (~10%) relative to patients/visitors. These studies represented workers in the United States, Saudi Arabia, Turkey, Australia, Israel and England. The majority of the studies (n = 12) were cross-sectional by design with data collected through worksite or postal mail surveys. Most (n = 8) studies asked workers to recall violent events in the previous 12-months, and the response rates ranged from 11% to 88% with half (n = 6) reporting rates greater than 50%. Eight studies examined the prevalence of violence in various hospital departments, while 8 focused specifically on the Emergency Departments (ED), and 1 on inpatient psychiatry. More than half (n = 9) of the studies examined violence in several workgroups, while several (n = 7) examined nursing staff or physicians (n = 2) only.

Study Definitions: Consistency in study definitions of Type II violence was noted, with several studies (n = 9) including elements of: (1) verbal assault or abuse; (2) verbal and/or physical threat; and (3) physical assault, with a few studies (n = 3) that also included (4) sexual assault/harassment (Table 3). Analyses, however, often did not reflect these distinct definitions, with only 5 studies reporting data stratified by these sub-types of violence, and fewer (n = 2) that considered these distinctions throughout their analyses. The prevalence of verbal abuse ranged from 22% to 90%, threat of violence from 12% to 64%, and physical assault from 2% to 32%. Consistently, studies reported a higher prevalence of verbal assault followed by threats and physical abuse, respectively. Three studies (Gates, Ross, & McQueen, 2006; Hesketh et al., 2003; Landau & Bendalak, 2007) reported this same pattern when examining the frequency of these forms of violence stratified by perpetrator (patient and visitor) (data not shown).

Worker Characteristics: Five studies examined the frequency of violence experienced by a mix of workgroups in various hospital departments. High proportions of events were reported by nurses, nurses' aides, and physicians, followed by other workgroups including paramedics, security guards, technicians, and triage/front desk workers (Table 4). Rodríguez-Acosta et al. (2010) and Findorff et al. (2004) identified inpatient psychiatry as having significantly higher rates of injury from physical assault relative to other departments. Intensive care, emergency, inpatient medical/surgical, neurology, orthopedics, physical/occupational therapy and outpatient clinics were other departments identified. Female workers were more likely to report violent events in four studies, while inconsistencies in years of age and years of job tenure were reported across studies.

Perpetrator characteristics: Nine studies detailed aspects of perpetrator characteristics (Table 5), with three of five studies indicating that the perpetrator was more likely to be a patient than visitor, while conversely two studies conducted in Turkey and Saudi Arabia reported that the perpetrator was more likely to be a visitor. Studies specific to

emergency departments consistently reported that perpetrators with mental illness (8%-88%), dementia (~57%) and/or suicidal behavior (21%) were factors that contributed to the violent events, as well as perpetrators who were under the influence of alcohol (45% to 94%) and/or illicit drugs (57% to 94%). Only a few studies asked about warning signs or activities preceding the event. Ayranci, Yenilmez, Balci, and Kaptanoglu (2006) reported that 13% of the events occurred in the context of telling the perpetrator bad news, while only a few (2.5%) occurred while examining or treating the patient. However, 47% of participants in this same study indicated they had a feeling in advance that something was about to happen. Two qualitative studies detailed specific behaviors displayed by patients/visitors prior to a violent event (Chapman, Perry, Styles, & Combs, 2009; Luck, Jackson, & Usher, 2007). Through the use of semi-structured focus groups involving ED staff, Luck et al. (2007) reported specific behaviors (using the acronym "STAMP") including Staring and eye contact, Tone and volume of voice, Anxiety, Mumbling and Pacing. Chapman et al. (2009) extended this work using similar methods and reported nine components of predicting violence and aggression including the five STAMP in addition to (EDAR) Emotions (fear, frustration), Disease process (confusion, intoxication, mental illness), Assertive/non-assertive (e.g., confrontational or not assertive), and Resources/organization pertaining to (e.g., long wait times). Repeat hospital admissions by patients in the ED and inpatient psychiatric unit were also identified as a risk factor, with 14 patients accounting for 45 (21%) of 218 violent incidents in the ED in a 12-month time period (James, Madeley, & Dove, 2006).

Work Environment: Environmental conditions present at the time of the violent events were identified through these studies which are listed in Table 5. Long wait times for procedures or care was considered a contributing factor to the event among participants in several studies. However, only one study by Ayranci et al. (2006) examined the actual length of time as a predictor and observed no significant differences ($p = 0.38$) when comparing wait times. James et al. (2006) observed a reduction in risk for physical violence in the ED (OR 0.18; 95% CI: 0.04, 0.85) when long wait times were examined as a predictor of physical violence when modeled with perpetrator factors such as being a patient (vs. visitor), being under the influence of drugs/alcohol and expressing suicidal ideation. Conflict or misunderstanding between the health care worker and the patient, as well as unmet patient demands were identified. Short staffing and lack of security guards present were reported as contributing factors, while Gates et al. (2006) also reported a lack of assistance by security guards who were present. While working alone was identified in several studies as a contributing factor, a specific work shift was not.

Consequences: Studies reporting workers' emotional responses to workplace violence suggest that it is not uncommon for them to experience anger and irritation (56% to 70%), as well as fear of being at work (17% to 44%) (Table 6). A large proportion (89%) of physicians surveyed in Minnesota reported that they were occasionally fearful of workplace violence, while 11% were frequently or constantly fearful (Kowalenko, Walters, Khare, Compton, & Michigan College of Emergency Physicians Workplace Violence Task Force, 2005). In this same study, 44% of physicians indicated feeling "less secure at work" because of violence in the ED, with a large proportion (42%) indicating that they carried some type of weapon to protect themselves (e.g., mace, knife, gun). Studies reported that workers felt humiliation and self-blame (42% to 26%) after an event, which was further highlighted by Gacki-Smith et al. (2009) who indicated that ED nurses (20%) considered the reporting of physical assault a sign of weakness. In one study, almost half (41%) of the hospital workers who experienced violence in the previous year indicated that they coped by "pretending it didn't happen" (El-Gilany et al., 2010).

Table 4
Frequency of Workplace Violence Stratified by Occupational Characteristics in the Hospital Setting.

	Ayranci N = 598 Violent Events	El-Gilany N = 302 Violent Events	Findorff N = 127 Physical Assaults	Rodiguez-Acosta N = 220 Physical Assaults	Winstanley N = 375 Physical Assaults
Work Group					
Nurse/ Midwife	34%	35%	17.8/100^	2.3/100*	66%
Nurses' Aide/PCA			8.9/100^	1.5/100*	13%
Physician	12%	29%			19%
Paramedic			25/100^		
Pharmacist		9%			
Security Guard			50/100^		
Ancillary	15%				
Physical Therapist					12%
Technician		31%			
Counselors/ Social Worker			17/100^		
Driver/ Servant		18%			
First meeting	4%				
Other					
Gender					
Men	40%	63%	18%	1.6/100*	
Women	60%	37%	82%	2.3/100*	
Race					
White			92%	1.6/100*	
Nonwhite			8%	1.7/100*	
NR			2%		
Age (years)					
<=29	46%	25%		1.7/100*	
30-39	39%	74%		1.7/100*	
40-49	13%			1.5/100*	
>49				1.6/100*	
Job Tenure (years)					
<5	60%	38%		1.9/100*	
5-10	25%	20%		1.7/100*	
>10	15%	41%		1.3/100*	
Work Department					
Emergency (ED)	19%	19%	17/100^	1.3/100*	4%
Outpatient Clinic	25%	3%			
Medical Surgical	15%		8/100^		52%
Psychiatry			28/100^	12.7/100*	
Pharmacy		10%			
ICU			36/100^	1.6/100*	
PT/OT/ Rehab			7/100^	3.6/100*	11%
Neurology				4.4/100*	
Ortho				2.0/100*	
Float				1.2/100*	
Other	4%				

^per 100 workers.
* per 100 FTEs-full time equivalents.

4. Discussion

The purpose of these analyses was to assess the utility of existing hospital data reported by workers that pertained to Type II violence with regard to identifying risk factors and examining rates of injury over time. In addition, we sought to identify risk factors for Type II violence that have been reported in the literature over a 10-year period. Findings from these analyses will be used as part of a larger study aimed at improving internal hospital reporting systems for capturing of hospital violent events.

Analyses of hospital data indicated that existing systems primarily captured events that involved physical assault, while no events that involved verbal abuse and/or threat of assault were captured. Given that these injuries were considered severe enough to be captured through workers' compensation, and the high prevalence of verbal abuse and

Table 5
Perpetrator and Environmental Characteristics for Reported Type II Violent Events.

	Ayranci n = 598 violent events	El-Gilany N = 972 perpetrators/ 913 events	Fernandes N = 114 physical assaults	Gacki-Smith N = 811 Workers with > 20 physical assaults	Gates n = 115 workers who experienced 329 physical assaults	James + n = 218 violent events	Kowalenko N = 1,908 violent events	Peek Asa + N = 198 EDs	Salerno N = 688 violent events
Setting	Hospital	Hospital	ED	ED	ED	ED	ED	ED	Psychiatry
Demographics									
Patient	31%	23%			51%	88%	72%		100%
Visitor	58%	68%			49%	12%	28%		
Males	77%		54%			65%			
Mental Health									
Dementia				59%	56%				NS
Mentally Ill	8%	5%	29%	92%	63%	14%			
Suicidal/Self-destructive							21%		
Involuntary Admission									48%
Restraint Treatment				68%					19%
Did not know	24%								
Lifestyle/Behavior									
Intoxicated - Alcohol	10%		47%	95%	80%	52%	45%	76%	
Illicit drug use			45%	94%	76%	5%		57%	
Drug seeking				94%					
Gang Related					10%			42%*	
History of Violence			31%						
Repeat Patient			30%			6%			94%
In pain/reaction to treatment		57%							
Environmental Characteristics									
Area open to public					37%				
Wait Time	45%			86%	69%	12%			
Payment/Billing Issues	21%								
Conflict between health care professional and patient		37%		70%					
Unmet demands		72%							
Over crowding		66%		91%					
Lack of security guard/ security guard not helpful		39%			36%/21%				
Short staffed		9%		66%	32%				
Limited visitor policy				70%					
Lack of policy/procedure for handling violence		67%			17%				
No check point for weapons					22%				
Working alone	48%	38%			15%				26% (MD)/ 4% (RN)
Worked Day Shift	54%	19%	47%						
Worked Evening Shift	23%	50%	14%						
Worked Night Shift	22%	31%	31%		28%				
Worked Rotating Shift			9%						
Door Closed		46%							

ED = Emergency Department.
+ Post Intervention data presented.
* combined estimate of drugs and gang.

threats reported in prior studies, we assume this is a conservative estimate of Type II workplace violence occurring among staff these institutions. In similar analyses, Bensley et al. (1997) observed that 85 cases of workplace violence reported through workers' compensation among psychiatric hospital nurses were considerably less than the 197 cases capture from these same workers during the same time period through survey methods. Verbal threats, which are considered "pre-events" (Runyan, 2001) or near misses, could be informative for the development of prevention strategies but were not captured. We were able to calculate rates of injury across workgroups, work departments, and over several years. However, these data were limited in details about the circumstances of the events, warning signs, whether the patient was in pain, if they were impaired, if situational factors triggered or escalated the event, and the consequences experienced by workers beyond a physical injury or lost work-time. There was also a lack of information on methods, if any, that staff used to handle these situations.

Through the review of 17 studies, we captured information pertaining to workplace, worker and perpetrator characteristics associated with Type II violence, as well as the consequences to workers resulting from these events. While these data were informative, they were limited with regard to assisting us with identifying established risk factors to include in our new system. The majority of included studies were cross-sectional that reported period prevalence of violence. Only two studies (Findorff et al., 2004, 2005; Rodríguez-Acosta et al., 2010) examined rates of violence; only one examined rates over time. With a lack of rate-based measures, the determination of risk from associated factors that were reported was not feasible. Moreover, comparison of high risk workgroups and work departments across studies was

Table 6
Reported Consequences Among Workers Exposed to Type II Violence.

	Ayranci 1,209	El-Gilany N = 302	Fernandes N = 217	Findorf N = 127	Kowalenko N = 171
Workgroup	All	All	All	All	MD
Setting	Hospital	Hospital	ED	All	ED
Job Satisfaction	27%	70%			
Changed place of work		2%	2%		16%
Considered leaving profession					19%
Physical injury	18%				
Mental/physical treatment	12%			2%/13%	1%
Lost time from work		5%			
Anger/Irritation	56%	70%	18%	49%/16%	
Fear/ Afraid at work afterwards		38%	17%	31%	11%/44%
Blamed Self/ Humiliation	26%	4%	2%	11%	
Careful/Super Alert		46%			
Carried weapon to protect self	25%				42%+
Pretend it didn't happen		41%			

+Weapons included gun, knife, mace, club.

limited. Examination of combined associations of multiple factors and the risk of Type II violence was missing. For example, several studies reported descriptive details about perpetrator and work environment factors for ED events including being male, having a mental illness, being intoxicated and long wait times, but only one (James et al., 2006) examined the risk of violence relative to these factors through multivariate modeling. The contradictory findings by James et al. (2006) in which they indicated that being a female patient increased the risk, while longer wait times reduced the risk of violence, illustrates the need for more rigorous analyses for purposes of developing informed prevention strategies. We found the qualitative studies that detailed perpetrator characteristics to be extremely informative, highlighting the importance of utilizing a mixed methods approach.

Due to the large number of studies ascertained in our initial query (January 1990 to February 2010) we chose to limit the time frame to studies published after 1999. For purposes of developing targeted workplace violence prevention strategies, Howard (1996) proposed defined workplace violence "types" (I through IV) due to their differences in the perpetrator's profile and motives, as well as differences in the characteristic of the workplaces and workers affected. Unfortunately, a large number of studies were not included in the review because violence types were mixed and we were not able to determine details specific to patient/visitor perpetrated violence.

4.1. Preliminary recommendations

Based on findings from the analysis of our existing administrative data and systematic review of the literature, we have outlined preliminary recommendations of broad categories to be included in a hospital violence surveillance system. These elements include: worker demographics (e.g., job title, work department); Type II violence sub-types (e.g., verbal abuse, threat of assault, physical assault); perpetrator characteristics (e.g., patient, visitor, gender); event setting (e.g., in person, phone, email); hospital location (e.g., emergency department, intensive care unit); physical location (e.g., hallway, exam room); hospital factors (e.g., emergency/acute situation, long wait time for care, short staffing, payment issue); perpetrator factors (e.g., receiving bad news, mental illness, drug seeking, medication withdrawal); warning signs (e.g., perpetrator's behavior of staring, anxiety, mumbling); type of weapon (e.g., knife, gun, body fluid); involvement of others (e.g., coworkers, security); interventions used (e.g., called security, restraint, verbal de-escalation); immediate consequences of the event for the worker (e.g., injured, worried about personal safety); workers' text description of the event; workers' text description of recommendations for future prevention efforts.

Some studies included in this review indicated that the underreporting of Type II violent events is a significant problem, which suggests that a system aimed at capturing these events would need to be easily accessible to the worker (e.g., online intranet reporting system) in a central location, with minimal time requirement on the part of the worker to report. Capturing these initial data could foster more thorough violent event investigation by occupational safety and health professionals beyond what is typically captured in a first-report of injury report. In addition, these data could be supplemented with discussions with workers involved in the event to gain a better understanding of event circumstances and consequences. Ideally, data from this system would be linked to worker demographic and administrative data for purposes of examining injury rates within and between workgroups over time, as illustrated in the DHSSS analyses. This linkage would also enable hospitals to examine changes in rates relative to their violence prevention efforts.

5. Summary

The purpose of examining our existing hospital violence reporting systems, and reviewing 10 years of previously published work, was to inform the development of an improved hospital violence reporting system. Our conclusions and recommendations are focused specifically on the reporting and capturing of circumstances surrounding violent events rather than broader contextual issues within a hospital or health care system. The existing literature and administrative data focused specifically on violent episodes, but does not address more macro-level factors that may contribute to workplace violence such as inadequate staffing, or pressure from management for workers to place high patient satisfaction ratings before their own safety, or lack of health insurance or poor access to care among patients. In addition, our recommendations do not address issues that influence reporting that were revealed in our review, including workers blaming themselves for violent events or perceiving reporting as a sign of weakness.

A large proportion of hospital workers in some of the studies we reviewed reported feelings of anger and irritation, as well as fear upon returning to work after being physically assaulted or verbally abused. In addition, some indicated that they had taken protective measures by arming themselves with weapons. These findings clearly support the need for prevention strategies aimed at protecting these workers. Our analyses of the DHSSS data, and those of others, document the need for more detailed surveillance methods that capture incident cases of workplace violence including circumstances surrounding these events. Such improvements will foster the development of targeted workplace violence prevention policies and strategies at the patient care unit and hospital level.

Acknowledgements

We acknowledge and thank Helena Vonville, Director of Library Services at the University of Texas, School of Public Health for directing the methods employed for the systematic review.

References

Ayranci, U., Yenilmez, C., Balci, Y., & Kaptanoglu, C. (2006). Identification of violence in Turkish health care settings. *Journal of Interpersonal Violence*, *21*(2), 276–296.
Bensley, L., Nelson, N., Kaufman, J., Silverstein, B., Kalat, J., & Shields, J. W. (1997). Injuries due to assaults on psychiatric hospital employees in Washington State. *American Journal of Industrial Medicine*, *31*, 92–99.

Chapman, R., Perry, L., Styles, I., & Combs, S. (2009). Predicting patient aggression against nurses in all hospital areas. *British Journal of Nursing*, *18*(8), 476–483.
Dement, J. M., Pompeii, L. A., Østbye, T., Epling, C., Lipscomb, H. J., James, T., et al. (2004). An integrated comprehensive occupational surveillance system for health care workers. *American Journal of Industrial Medicine*, *45*(6), 528–538.
El-Gilany, A. H., El-Wehady, A., & Amr, M. (2010). Violence against primary health care workers in al-hassa, saudi arabia. *Journal of Interpersonal Violence*, *25*(4), 716–734.
Farrell, G. A., Bobrowski, C., & Bobrowski, P. (2006). Scoping workplace aggression in nursing: findings from an australian study. *Nursing and Healthcare Management and Policy*, 778–787.
Fernandes, C., Raboud, J. M., Christenson, J. M., Bouthillette, F., Bullock, L., Ouellet, L., et al. (2002). The effect of an educatin program on violence in the emergency department. *Annals of Emergency Medicine*, *39*(1), 47–55.
Findorff, M. J., McGovern, P. M., Wall, M. M., & Gerberich, S. G. (2005). Reporting violence to a health care employer: A cross-sectional study. *AAOHN Journal*, *53*(9), 399–406.
Findorff, M. J., McGovern, P. M., Wall, M., Gerberich, S. G., & Alexander, B. (2004). Risk factors for work related violence in a health care organization. *Injury Prevention*, *10*(5), 296–302.
Gacki-Smith, J., Juarez, A. M., Boyett, L., Homeyer, C., Robinson, L., & MacLean, S. L. (2009). Violence against nurses working in US emergency departments. *Journal of Nursing Administration*, *39*(7–8), 340–349.
Gates, D. M., Ross, C. S., & McQueen, L. (2006). Violence against emergency department workers. *The Journal of Emergency Medicine*, *31*(3), 331–337.
Gerberich, S. G., Church, T. R., McGovern, P. M., Hansen, H., Nachreiner, N. M., Geisser, M. S., et al. (2005). Risk factors for work-related assaults on nurses. *Epidemiology*, *16*(5), 704–709.
Hesketh, K. L., Duncan, S. M., Estabrooks, C. A., Reimer, M. A., Giovannetti, P., Hyndman, K., et al. (2003). Workplace violence in alberta and british columbia hospitals. *Health Policy*, *63*(3), 311–321.
Howard, J. (1996). State and local regulatory approaches to preventing workplace violence. *Occupational Medicine: State of the Art Reviews*, *11*(2), 293–301.
James, A., Madeley, R., & Dove, A. (2006). Violence and aggression in the emergency department. *Emergency Medicine Journal*, *23*(6), 431–434.
Jones, M. K. (1985). Patient violence: Report of 200 incidents. *Journal of Psychosocial Nursing*, *23*, 12–17.
Kowalenko, T., Walters, B. L., Khare, R. K., Compton, S., & Michigan College of Emergency Physicians Workplace Violence Task Force (2005). Workplace violence: A survey of emergency physicians in the state of michigan. *Annals of Emergency Medicine*, *46*(2), 142–147.
Landau, S. F., & Bendalak, Y. (2007). Personnel exposure to violence in hospital emergency wards: A routine activity approach. *Aggressive Behavior*, *34*(1), 88–103.
Luck, L., Jackson, D., & Usher, K. (2007). STAMP: Components of observable behaviour that indicate potential for patient violence in emergency departments. *Journal of Advanced Nursing*, *59*(1), 11–19.
Merchant, J. A., & Lundell, J. A. (2001). Workplace violence intervention research workshop, April 5–6, 2000, Washington, DC: Background, rationale and summary. *American Journal of Preventive Medicine*, *20*(2), 135140.
Peek-Asa, C., Cubbin, L., & Hubbell, K. (2002). Violent events and security programs in california emergency departments before and after the 1993 hospital security act. *Journal of Emergency Nursing*, *28*(5), 420–426.
Peek-Asa, C., Runyan, C. W., & Zwerling, C. (2001). The role of surveillance and evaluation research in the reduction of violence against workers. *American Journal of Preventive Medicine*, *20*(2), 141–148.
Rodríguez-Acosta, R. L., Myers, D. J., Richardson, D. B., Lipscomb, H. J., Chen, J. C., & Dement, J. M. (2010). Physical assault among nursing staff employed in acute care. *Work*, *35*(2), 191–200.
Runyan, C. W. (2001). Moving forward with research on the prevention of violence against workers. *American Journal of Preventive Medicine*, *20*, 169–172.
Salerno, S., Dimitri, L., & Talamanca, I. F. (2009). Occupational risk due to violence in a psychiatric ward. *Journal of Occupational Health*, *51*(4), 349–354.
Winstanley, S., & Whittington, R. (2004). Aggression towards health care staff in a UK general hospital: Variation among professions and departments. *Journal of Clinical Nursing*, *13*(1), 3–10.

Lisa Pompeii, PhD, is an occupational injury epidemiologist and an Associate Professor in the Division of Epidemiology, Human Genetics and Environmental Sciences at the University of Texas Health Science Center at Houston. Dr. Pompeii's research interests include musculoskeletal and violence-related injuries incurred by healthcare workers. She is currently the Principal Investigator for the NIOSH funded Hospital Violence Surveillance Study with which this manuscript is based.

John M. Dement, PhD, CIH, is a Professor in the Division of Occupational and Environmental Medicine, Duke University Medical Center. Prior to joining the Duke University faculty in 1993, Dr. Dement served in the U.S. Public Health Service for 22 years where he was employed in various research and management positions by the National Institute for Occupational Safety and Health (NIOSH) and the National Institute of Environmental Health Sciences (NIEHS). His research interests include occupational lung diseases, occupational cancers, exposure assessment for occupational epidemiology, workplace violence, and development surveillance systems for occupational diseases and injuries.

Ashley Schoenfisch, MSPH is a research analyst in the Division of Occupational and Environmental Medicine at Duke University Medical Center. Ms. Schoenfisch has research interests in occupational safety and health, including the evaluation of interventions to prevent work-related injuries, the use of both quantitative and qualitative research methods, and the use of surveillance data to address work-related public health questions. Her research experience primarily includes studies of workers in healthcare and construction sectors.

Amy M. Lavery, MPH is currently a graduate student in the doctoral epidemiology program at the University of Texas, School of Public Health. Her research interests in occupational and environmental epidemiology, specifically as they relate to indoor air quality.

Megan Souder, MPH conducted a practicum with the Hospital Violence Study as part of her graduate school program. Her research interests include environmental and occupational epidemiology, disease outbreak investigation and clinical trials.

Claudia DiSabatino Smith, PhD, RN, NE-BC earned her doctoral degree from The University of Texas Health Science Center at Houston. Dr. Smith currently serves as the Director of Nursing Research at St. Luke's Episcopal Hospital in Houston Texas where she is a co-investigator on several studies. Her research interests include nursing clinical credibility and the nursing workforce.

Hester Lipscomb, PhD is an occupational injury epidemiologist. She is a Professor in the Division of Occupational and Environmental Medicine at Duke University Medical Center, Durham, NC. Her research focus includes injuries incurred by workers in healthcare, construction and poultry.