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# A Survey of Workplace Violence Across 65 U.S. Emergency Departments

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## Abstract

**Objectives:** Workplace violence is a concerning issue. Healthcare workers represent a significant portion of the victims, especially those who work in the emergency department (ED). The objective of this study was to examine ED workplace violence and staff perceptions of physical safety.

**Methods:** Data were obtained from the National Emergency Department Safety Study (NEDSS), which surveyed staff across 69 U.S. EDs including physicians, residents, nurses, nurse practitioners, and physician assistants. The authors also conducted surveys of key informants (one from each site) including ED chairs, medical directors, nurse managers, and administrators. The main outcome measures included physical attacks against staff, frequency of guns or knives in the ED, and staff perceptions of physical safety.

**Results:** A total of 5,695 staff surveys were distributed, and 3,518 surveys from 65 sites were included in the final analysis. One-fourth of surveyed ED staff reported feeling safe sometimes, rarely, or never. Key informants at the sampled EDs reported a total of 3,461 physical attacks (median of 11 attacks per ED) over the 5-year period. Key informants at 20% of EDs reported that guns or knives were brought to the ED on a daily or weekly basis. In multivariate analysis, nurses were less likely to feel safe "most of the time" or "always" when compared to other surveyed staff.

**Conclusions:** This study showed that violence and weapons in the ED are common, and nurses were less likely to feel safe than other ED staff.

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**Keywords:** emergency department, violence, weapons, safety, workplace

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Workplace violence is a concerning occupational hazard, and healthcare facilities are among the more frequent sites for violence. Between 1993 and 1999, there were 1.7 million episodes of workplace-related violence annually in the United States, and in 12% of these episodes, the victim was a

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healthcare or mental health worker.<sup>1</sup> These numbers are thought to be underestimates, because episodes of violence in healthcare settings are not always reported.<sup>1-4</sup>

In the hospital setting, the emergency department (ED) is a common location for workplace violence.<sup>3,5-7</sup> Aspects of an ED that are designed to increase patient access to care, such as ease of entry, may also inadvertently make it easier for weapons to be brought into facilities.<sup>4,8,9</sup> Inside the ED, patients may experience long wait times and stress regarding underlying medical conditions. These factors, along with substance abuse and psychiatric comorbidities, also contribute to violence toward staff.<sup>3,4,10</sup>

The consequences of workplace violence for the emotional well-being of healthcare workers include anger, anxiety, fear, and decreased job satisfaction.<sup>3,4,7,11-14</sup> Furthermore, perceptions of decreased personal safety may adversely affect the ability of staff to care for patients.<sup>15</sup>

Previous studies have examined perceptions of safety and the incidence of physical attacks and weapons brought to the ED in single hospitals and even

states.<sup>8,16-19</sup> The purpose of this study was to examine more broadly workplace violence and perceptions of personal safety in EDs. Using survey data from 65 EDs across the United States, we determined the number of physical attacks against staff by patients or visitors and the frequency with which weapons were brought to the ED. In addition, we identified how often staff felt safe at work and determined which ED and staff characteristics were associated with perceptions of physical safety. We also determined which ED characteristics were associated with higher frequency of weapons and attacks.

## METHODS

### Study Design and Population

Data were obtained from the National Emergency Department Safety Study (NEDSS), which examined clinical processes and systemic factors contributing to patient safety at hospital EDs. Detailed recruitment efforts were described previously.<sup>20</sup> EDs that participated in NEDSS consisted largely of sites affiliated with the Emergency Medicine Network (EMNet, <http://www.emnet-usa.org/>), an ED-based research collaboration. Of the 102 sites that initially agreed to participate in NEDSS, 69 sites completed the surveys and 33 withdrew. Reasons for withdrawal included inadequate numbers of administrative or research staff, failure of the institutional review board or administration to approve the study, and departure of key research staff from the site. The institutional review board of all participating institutions approved the study.

### Survey Content and Administration

A component of the NEDSS involved distributing two different surveys to participating ED personnel. One survey (the "staff survey") assessed staff perceptions of working conditions, clinical processes, and systemic factors that might contribute to errors in the ED. The survey included questions about equipment, staffing, teamwork, information management, organizational factors, and coordination of care. The survey also included a question regarding physical safety in the ED.

To develop the NEDSS survey, the study team revised a previously developed instrument. We added questions to assess specific ED process failures and attributes that might contribute to errors. To further refine the survey, investigators conducted key informant interviews and focus groups at three EDs. Key informants included ED medical directors, nurse managers, physicians, nurses, and administrators. In addition, the survey underwent cognitive testing within the focus groups, and these data were used to assure consistent and accurate interpretation of survey items. Ten EDs served as sites for psychometric testing, and data from these sites were used to determine a final set of questions.

The final survey was available in paper and online format and was administered to ED staff (doctors, nurses, residents, and physician assistants) who worked at least one shift per week and provided clinical care. Eighty staff members were randomly selected from each of the sites with more than 80 eligible staff. Only the selected staff members received the survey at these

sites. At sites with fewer than 80 staff, and at the 10 sites that participated in the psychometric survey, all eligible staff members received the survey. Nonresponders received additional surveys at 2-week intervals for a total of three surveys. Further details of survey development and distribution were described previously.<sup>20</sup>

A second survey was administered to one "key informant" at each site to collect data on ED attributes that might affect staff perceptions of personal safety and that would be most reliably reported by ED leaders or managers. The survey was distributed to each site principal investigator (PI), who was responsible for obtaining the necessary information to complete the survey. The PIs or "key informants" collected information from ED chairs, medical directors, nurse managers, and administrators.

### Measurements

The staff survey contained questions on factors contributing to patient safety in the ED. The key question of interest used for the current analysis asked how often "ED personnel felt physically safe while working in the ED." Responses employed a 5-point Likert scale (never, rarely, sometimes, most of the time, or always). Data on demographic (age, gender, ethnicity, race) and professional (occupation and years worked) characteristics of the respondents were also collected.

The key informant survey covered topics such as annual patient visit volume, ED type, presence of residency programs, and other topics. The question of interest used for our study asked for the "total number of physical attacks by ED patients (or visitors) on ED personnel over the past 5 years." Also, to obtain further data on factors not assessed in the initial key informant survey, a 4-item questionnaire was sent via e-mail to key informants at the 65 participating EDs that included the following yes/no questions: 1) "Are all visitors and patients (with the exception of those arriving by metal stretcher) screened with metal detectors prior to entering the ED?" 2) "Does the ED have in-hospital security personnel available 24 hours a day?" 3) "Are ED doctors and nurses trained in techniques for managing violent patients?" The survey also asked, "On average, how often are patients or visitors found to have unauthorized guns or knives in the ED? This includes guns or knives found at a security checkpoint, metal detector, or in triage." This answer to Question 4 was recorded as "daily," "weekly," "monthly," "yearly," or "less than yearly."

### Data Analysis

We conducted three multivariate analyses to determine which respondent and ED characteristics were associated with perception of safety and which ED characteristics were associated with increased frequency of attacks and weapons. To conduct the analysis, a weight was computed for the respondents that accounted for the differential sampling and nonresponse rates by site. Due to concerns that the staff position (attending physician, resident, nurse practitioner, nurse, physician assistant, other) held by the respondent might bias the responses, an adjustment was made by position to

obtain the final weight. All analyses were done using SAS 9.0.<sup>21</sup> and SUDAAN 9.0.1.<sup>22</sup>

First, we determined whether reported levels of violence and safety infrastructure were associated with staff perception of safety, after controlling for staff and ED characteristics. The dependent variable in the analysis consisted of perception of safety at the individual level as recorded in the staff survey and was dichotomized as never/rarely/sometimes and most of the time/always. We used PROC NL MIXED in SAS 9.0<sup>21</sup> to fit a random-intercept logistic regression model to assess the association of outcome with the critical independent variables from the key informant survey: number of physical attacks, frequency of weapons (daily/weekly, monthly/yearly, less than yearly), presence of metal detectors, and availability of a violence training program. We used a mixed model, with a random-effects variable being the ED site, to account for clustering due to respondents being from the same ED. The model controlled for independent variables obtained from the staff data, including age, gender, ethnicity, race, occupation, and number of years worked. The model also controlled for ED characteristics, including ED type, number of visits, and region.

We then determined whether metal detectors were associated with frequency of weapons. We used a logistic regression model (PROC GENMOD in SAS 9.0<sup>21</sup> with dist=bin and link=logit) to predict the probability of weapons being reported as "daily/weekly" as a function of the presence of metal detectors while controlling for ED type, number of visits, and region.

Third, we determined which ED characteristics were associated with frequency of attacks. For this analysis, we used a linear model (PROC GENMOD with dist=normal and link=identity) to assess whether frequency of weapons, presence of metal detectors, and availability of violence training were associated with number of attacks when controlling for ED type, number of visits, and region.

## RESULTS

In total, 5,695 staff surveys were distributed, and the overall response rate at the 69 participating EDs was 66%. To minimize nonresponse bias, we excluded staff responses from four EDs with response rates of 45% or less and surveys missing 80% or more items. There were no statistically significant differences in main characteristics between the 65 EDs that were included and the 4 that were excluded from the analysis (data not shown). Of the 3,641 staff surveys, 3,518 were included in the final analysis. At the ED level, key informants at all 65 sites completed the initial key informant survey, and of those, 62 (95%) completed the follow-up e-mail survey.

Table 1 displays the demographic and occupational characteristics of the staff included in the final analysis. Most of the respondents were women. Nurses comprised 55% of the survey respondents; attending physicians were the second most represented group, followed by residents. One-third of respondents had worked in the ED for less than 3 years, and 26% of respondents had worked greater than 10 years.

**Table 1**  
Staff Characteristics Reported in Staff Survey

Staff Characteristics	n	%‡
Age (years)		
18–29	648	19
30–39	1,328	38
40–49	931	27
50–59	517	15
≥60	60	2
Gender		
Female	2,120	64
Male	1,355	36
Ethnicity		
Latino/Hispanic	163	5
Race*		
White	2,730	80
African American	233	7
Asian	267	8
Other†	194	6
Occupation		
Attending	776	19
Resident	619	16
Nurse practitioner	32	1
Nurse	1,805	55
Physician assistant	88	3
Other	169	7
Years worked		
0 to <3	1,123	32
3 to <5	698	20
5 to <10	738	22
≥10	913	26
Hours/week worked		
0 to <30	772	22
30 to <40	1,268	37
40 to <50	768	23
≥50	656	18
Feel safe		
Never	78	2
Rarely	200	6
Sometimes	639	19
Most of the time	2,150	61
Always	451	12

\*Respondents were allowed to select multiple categories.  
†Other includes answer choices marked as American Indian/Alaska Native, Native Hawaiian/other Pacific Islander, and other.  
‡Weighted for sample design and nonresponse.

Seventy-three percent of staff reported they felt safe most of the time or always. Another 19% said they sometimes felt physically safe; the remaining 8% of ED staff reported that they never or rarely felt physically safe while working in the ED.

The distribution of attacks and weapons reported by key informants is displayed in Table 2. The majority of EDs were combined adult and pediatric EDs. Forty-five percent of EDs were from the Northeast, and 62% were the primary site for an emergency medicine residency program. The overwhelming majority (94%) of key informants reported their site had in-hospital security personnel available 24 hours per day. Slightly less than half of key informants reported training nurses and physicians in techniques for managing violent patients. Only 14% of key informants reported using metal detectors to screen nonstretcher patients or visitors.

Overall, key informants reported more than 3,461 physical attacks for the 5-year period. The reported

Table 2  
Attacks and Weapons by Emergency Department (ED) Characteristics

ED Characteristics	n (%)	Attacks over 5-Year Period [Median (25%, 75%)]	EDs Reporting Weapons*		
			Daily/Weekly	Monthly/Yearly	<Yearly
Total	65	11 (5, 25)	13	35	11
ED type					
Adult only	13	12 (5, 20)	3	7	1
Combined	52	10 (5, 25)	10	28	10
ED visits/year					
<40,000	12	10 (0, 20)	1	7	4
40,000–59,999	21	10 (8, 18)	7	9	2
60,000–79,999	19	15 (0, 50)	3	11	4
≥80,000	13	15 (7, 30)	2	8	1
Region					
Northeast	29	10 (5, 28)	3	21	4
Midwest	15	18 (7, 25)	3	5	5
South	8	7 (5, 15)	3	4	0
West	13	10 (8, 50)	4	5	2
Security personnel†					
Yes	61	11 (5, 25)	12	35	11
No	1		1	0	0
Metal detector†					
Yes	9	15 (10, 75)	6	1	1
No	53	10 (5, 25)	7	34	10
Violence training†					
Yes	29	10 (4, 25)	4	18	5
No	33	12 (7, 28)	9	17	6
Residency program					
None	16	10 (3, 15)	2	10	3
Primary site	40	15 (5, 50)	10	20	5
Secondary site	9	10 (2, 25)	1	5	3

\*Six sites did not respond to this question.  
†Three sites did not respond to this question.

number of attacks ranged from zero to “over 1,000” (analyzed as 999, which was the highest response allowed in the 3-digit answer space), with a median of 11 physical attacks per site for the 5-year period. Twenty percent of key informants reported that guns or knives were brought to the ED daily or weekly.

### Multivariate Analysis

Results from the multivariate analysis indicated that after controlling for staff and ED characteristics, nurses were five times less likely to feel safe “most of the time” or “always” compared to attendings, residents, nurse practitioners, and physician assistants (odds ratio [OR] = 0.21; 95% confidence interval [CI] = 0.16 to 0.28;  $p < 0.0001$ ; Table 3). White individuals felt safest among the self-identified races. Staff who had worked more than 5 years felt less safe than staff who had worked shorter periods of time. Staff in the Northeast felt the least safe. Frequency of weapons, number of attacks, presence of metal detectors, and violence training were not statistically significant predictors of staff feeling safe most of the time or always.

In multivariate analysis, EDs with metal detectors reported a higher number of physical attacks (Table 4) and were much more likely to have weapons brought to the ED on a daily or weekly basis (data not shown; OR = 26.3; 95% CI = 2.0 to 339;  $p = 0.01$ ). Frequency of weapons was not associated with the actual number of attacks. Also, adult-only EDs were associated with a

higher number of attacks than combined adult/pediatric EDs.

### DISCUSSION

The objective of this study was to examine ED workplace violence and staff perceptions of physical safety. We found that one-fourth of ED staff felt safe only sometimes, rarely, or never. Staff who had worked in the ED for greater than 5 years felt less safe than those staff members who had worked fewer years. This finding may be due to the fact that staff felt less confident about their personal safety and skills in managing violent patients as they witnessed more events with time. Ideally, staff with more experience should have a greater sense of personal safety, especially since some studies show that the management of violent patients is a skill that can be learned.<sup>12,17</sup>

Nurses felt the least safe among surveyed staff. Their close association with patients throughout the ED visit may expose them more frequently to violence and therefore cause them to feel less safe. This finding is consistent with other studies that have shown increased victimization of nurses.<sup>11,14,23</sup> These studies looked at staff from a single institution and found that nurses experienced more physical assaults.

Our study also showed an association between race and perception of safety. White individuals felt safer than all other self-identified races, but to our



**Table 3**  
Multivariate Logistic Regression Model Evaluating Characteristics Associated with a Perception of Safety "Most of the Time" or "Always"

Characteristic	Odds*	95% CI		p-Value
		Lower	Upper	
Attacks	1.00	0.999	1.001	0.93
Frequency of weapons				0.66
Daily/weekly	0.88	0.44	1.76	
Monthly/yearly	0.79	0.46	1.34	
Less than yearly	1.00	Reference		
Metal detector present	0.66	0.30	1.46	0.30
Violence training present	1.46	0.98	2.17	0.06
Age (years)				0.21
18–29	1.00	Reference		
30–39	0.78	0.57	1.08	
40–49	0.82	0.57	1.16	
≥50	0.99	0.66	1.47	
Male	1.03	0.81	1.30	0.83
Hispanic ethnicity	0.99	0.57	1.73	0.97
Race				0.01
White	1.00	Reference		
African American	0.83	0.56	1.23	
Asian	0.98	0.66	1.44	
Other	0.49	0.32	0.75	
Occupation				<0.0001
Attending	1.00	Reference		
Resident	1.17	0.76	1.81	
Nurse practitioner	1.13	–0.35	3.68	
Nurse	0.21	0.16	0.28	
Physician assistant	1.08	0.49	2.38	
Other	0.35	0.20	0.59	
Years worked				<0.0001
0 to <3	1.00	Reference		
3 to <5	0.67	0.50	0.89	
5 to <10	0.44	0.33	0.59	
≥10	0.48	0.35	0.65	
Combined adult/ pediatric ED	1.07	0.62	1.83	0.81
ED visits/year				0.01
<40,000	0.88	0.46	1.71	
40,000–59,999	2.51	1.29	4.89	
60,000–79,999	1.19	0.67	2.09	
≥80,000	1.00	Reference		
Region				0.001
Northeast	1.00	Reference		
Midwest	2.10	1.25	3.53	
South	2.79	1.41	5.51	
West	2.35	1.32	4.16	

Intraclass correlation coefficient = 0.088 (standard error = 0.023).  
ED = emergency department.  
\*Estimated from a random intercept logistic regression model.

knowledge this has not been explored or confirmed in other studies. This finding raises questions as to whether minority staff feel more vulnerable and merits further research.

Despite the high prevalence of weapons being brought into EDs and the fact that a significant number of ED staff felt unsafe at least some of the time, less than 15% of EDs had metal detectors. There are differing opinions about the merits of metal detectors. Some ED managers and personnel are concerned that they may undermine the public image of EDs or constitute an invasion of privacy.<sup>24,25</sup> However, studies indicate that most visitors and patients look favorably upon

**Table 4**  
Parameter Estimates for Linear Regression Model Assessing ED Characteristics Associated with Attacks

ED Characteristic	Estimate (No. of Attacks)	Standard Error	p-Value
Frequency of weapons			
Daily/weekly	18	66	0.48
Monthly/yearly	58	52	
Less than yearly			
Metal detectors			
Yes	184	72	0.01
No			
Violence training			
Yes	23	40	0.57
No			
ED type			
Adult only	116	52	0.03
Combined			
ED visits/year			
<40,000	–75	66	0.005
40,000–59,999	–138	65	
60,000–79,999	47	57	
≥80,000			
Region			
Northeast			
Midwest	36	52	0.09
South	–21	62	
West	128	55	

ED = emergency department.

metal detectors and feel they contribute to a safer environment.<sup>25–27</sup>

Our study showed that the presence of metal detectors was associated with a higher number of weapons. The reason for this could be because those EDs that frequently had weapons brought to their facility may have been more likely to institute metal detectors or that the institution of metal detectors led to the discovery of more weapons. Further studies are needed to determine if metal detectors actually decrease violence in EDs.

Workplace training programs teach employees how to handle escalating situations. Our study showed that less than half of EDs had some type of violence training program for staff. Staff at EDs with violence training programs felt safer than staff in EDs without such programs, but the relationship was of borderline statistical significance. Other studies, however, have shown that training programs can increase staff confidence in managing violent incidents.<sup>17,28,29</sup> Because nurses felt safe least often, they may benefit the most from these programs. Also, our study did not take into account staff perception of safety before training programs were instituted. Studies that look at perception of safety before and after institution of training programs may more accurately determine whether these programs increase staff perception of safety.

Although educational initiatives on managing patient aggression may assist in improving staff confidence and perception of safety, there are few data to prove that these programs actually reduce the number of incidents. Our study did not show a significant association between the presence of a violence training program and the number of attacks, but we did not look at this

trend temporally and thus could not rule out the possibility that EDs with greater levels of violence were more likely than other EDs to institute violence training. Another study, which surveyed staff at a single center, did show a temporary reduction in violent incidents 3 months after institution of an educational program, but did not clearly show a decrease in the long run.<sup>17</sup>

Despite this, there have been numerous organizational efforts to promote personal safety through staff education, including the Hospital Security Act of 1993, which was implemented by the state of California to encourage hospitals to educate ED employees on safety and promote security assessment.<sup>30</sup> The American College of Emergency Physicians also issued a policy statement recommending that hospitals educate staff on handling violence.<sup>31</sup> The efficacy of violence prevention education in reducing the actual number of events is an area that clearly deserves further study.

### LIMITATIONS

The majority of EDs that participated in the study were in large, academic environments that may have different violence rates than other EDs. Although an attempt was made to include nonacademic, nonmetropolitan EDs, none agreed to participate. Furthermore, our sample may not be representative of the nation; one-third of EDs withdrew from the study and a large portion of EDs that participated were from the Northeast. Our final response rate to the questionnaire was 66%, and although we adjusted for nonresponse, this still may have biased the results.

Key informants may have had different interpretations of what constituted an attack against staff or may have used estimates rather than verified reports to determine the number of attacks. Therefore, reporting of attacks may have varied by site. However, standardized reports are not always filed for attacks in the healthcare setting, and therefore, despite this limitation, many studies use self-reported data to determine frequency of events.<sup>1,2</sup> Similarly, presence or lack of formal reporting mechanisms, as well as metal detectors among different institutions, may have caused the number of weapons found or recorded to vary. Staff perception of safety may have also reflected factors not specifically controlled for in this analysis, such as adequate staffing for all shifts, timing of shifts, and organizational response after an event has occurred.<sup>2,32</sup>

### CONCLUSIONS

Our study contributes to the overall understanding of the prevalence of violence in the ED and suggests the importance of assessing levels of violence in the health care workplace generally. Up to one-fourth of staff feel unsafe in the ED, and weapons and attacks toward staff are not rare events. Policy makers must identify prevention programs and systems that reduce violence and weapons and improve personal safety, particularly for nurses and minorities, who feel the least safe. Aggression management techniques and metal detectors need to be further evaluated for their effect on ED violence prevention as well.

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