Workplace Violence

Prevalence and Risk Factors in the Safe at Work Study

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Objective: Nurses face one of the highest rates of reported workplace violence (WPV). This research examined the prevalence of WPV and demographic, work-related, and adult and childhood abuse histories as risk factors for WPV among 2166 nurses/nursing personnel across four health care institutions in one US metropolitan area. **Methods:** Using data from an online cross-sectional survey, multivariate logistic regression was utilized to determine risk factors for physical and psychological WPV. **Results:** Almost one-third (30%) of nurses/nursing personnel experienced WPV (19.4% physical, 19.9% psychological). Risk factors included being a nurse, white, male, working in the emergency department, older age, longer employment, childhood abuse, and intimate partner violence. **Conclusions:** Adult and childhood abuse histories have not been considered in previous large-scale investigations, but were significant risk factors along with other previously identified risk factors for WPV.

According to the Bureau of Labor Statistics (1993–1999), nurses were victims of nonfatal assaults more than twice as often as any other medical field workers.[1] One state-specific study of workplace assaults across all industries found that the health care sector sustained nearly three times more compensated assault injuries than any other occupation.[2] Nurses attributed absenteeism and a desire to leave the profession to workplace violence (WPV),[3,4] and health care workers who had been victims of WPV reported fearing future violence and experienced a decrease in positive perceptions of their jobs.[5,6] Nurses experience high rates of violence exposure relative to other health care workers; consistent with this, in a large study of emergency department (ED) staff, nurses' perceptions of safety was lower than all other types of ED staff.[7] Given the current shortage of nurses and difficulty with nurse recruitment, WPV must be recognized as a significant factor in the retention of nursing professionals and in quality of care.

There is wide variation in reports of violence experienced by nurses, related to differing operational, setting, and population definitions; time frames; and study design. Among studies that have focused on nurses and nursing personnel who are *not* in specialized settings (eg, psychiatric units, nursing home), the prevalence of physical assault ranges from 9.5% to 31.7% of relatively large (n = 413–34,107) US and international samples.[4,8,9–17] Setting-specific prevalence is more widely varied; for example, in United States–based research, 17.3% of critical care nurses reported physical abuse in a national study (n = 5562)[18]; 82.1% of ED nurses and 77.8% of intensive care unit nurses in a regional medical center reported physical assaults by patients and family members (n = 86).[6] Psychological violence, including harassment, threats, and verbal abuse, is more prevalent, with between 23.6% and 96% of nurses experiencing verbal abuse in relatively large (n = 264–4918) US and international samples with nonspecified perpetrators.[4,8,12,14–16,19–22] Including department-specific numbers increases the range of these estimates; for example, in United States–based research, 59.7% of critical care nurses reported verbal abuse and 16.1% reported sexual harassment in a national study[18]; 100% of ED nurses and 77.8% of intensive care unit nurses in a regional medical center reported verbal assaults by patients and family members.[6] Two major studies of verbal abuse by other health care personnel reported harassment by coworkers as 5.9%,[8] 8% by supervisors[9] and 90% by physicians.[23] Physical and nonphysical violence are not mutually exclusive; nurses and nursing personnel who have experienced physical violence often have also experienced verbal abuse, harassment from superiors, sexual harassment, and threats.[11,24]

The majority of physical violence against health care professionals is perpetrated by patients.[12,14,23–26] Most studies have found that patients' visitors are the second most common perpetrators of physical violence,[12,25] although some have found coworkers[26] or supervisors[14] as the second most common source of violence. The perpetrator of verbal abuse is more varied. Common perpetrators include patients, patients' visitors, physicians, coworkers, and supervisors.[12,14,19,21,22,24,26] In two studies, physicians were identified as the most frequent perpetrators of verbal abuse.[20,22]

RISK FACTORS

Previous studies of risk factors and WPV have primarily focused on predicting or identifying patients or situations that are most likely to escalate to violence.[6,27,28] Fewer studies have examined risk factors for physical and verbal abuse among nurses and nursing personnel in general medical settings.[4,9,11,13,14,24,29] Differences in health care policy and culture may decrease the generalizability of international[4,9,11,29] findings. Licensed practical nurses and nursing aides are more likely to experience violence than registered nurses.[9,11,24] One US study examined risk factors across these groups and found licensed practical nurses at increased risk of physical violence when they had been in the profession greater than 10 years and when their primary activity was supervisory; while registered nurses were at increased risk when they were performing direct patient care.[24]

In almost all studies, working in the ED,[6,9,11,13,14,24] on a psychiatric unit,[4,9,11,13–15] in intensive care,[6,13,14,24] and in geriatric/long-term care[9,11,13,14,24] has been found to increase the risk for physical assault and verbal abuse in comparison to other settings. Other workplace factors found to increase the risk of physical assault are uncertainty regarding patient treatment, poor quality teamwork, role conflict and ambiguity, time pressures, dissatisfaction with work schedules, high levels of physical strain at work, frequent interruptions, irregular hours/night shift, and nursing shortages,[2,9,11]

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Male nurses report higher levels of physical and nonphysical violence than do female nurses.[4,9,11,24,29] Younger age[9,11,24] and having an associate degree education (vs diploma or bachelor's degree) are related to increased physical and nonphysical WPV.[24] In addition, nurses who have poor interpersonal relationships with supervisors, management, colleagues, physicians and/or administration are at higher risk for experiencing physical violence.[9] Race and the number of years worked as a nurse or in a particular department appear to have little effect on the experience of violence in the workplace.[24]

There is wide variation in the estimates of physical and psychological WPV among nurses and nursing personnel across studies[4,8–17,19–21,30] and only a single small (n = 67) research study has included other forms of interpersonal violence as risk factors for WPV.[31] This research reports an analysis of prevalence of and risk factors for physical and psychological WPV against nurses and nursing personnel from a US sample recruited for an ongoing prospective study.

METHODS

The four participating health care institutions included a large urban 1085-bed medical center, an affiliated 363-bed community hospital, a 277-bed suburban community hospital, and a 158-bed geriatric care center. Study participants were English speaking, at least 18 years of age, and employed at the participating hospital for at least 4 weeks prior to assessment. Respondents totaled 2166 (52% response rate), the majority of whom (90%) completed surveys anonymously on a secure Web site (paper versions were available). The survey content addressed the prevalence of WPV, associated risk factors, and outcomes of WPV among the study population. The institutional review board at the Johns Hopkins Medical Institutions approved this research.

Definitions of WPV

Definitions of physical and psychological WPV and the respective survey instrument used in this study were derived from the Joint Programme on Workplace Violence in the Health Sector, a collaboration between the International Labour Office, International Council of Nurses, World Health Organization, and Public Services International.[32] The questionnaire is applicable in that it specifically addresses the health care sector and has been frequently used in similar research. The *experience of physical WPV* was defined as "the use of physical force against another person or group, or threat of physical force, that results in physical, sexual or psychological harm." *Psychological WPV* was defined as "verbal abuse, bullying, stalking, or sexual harassment." Participants were asked whether they had experienced physical and/or psychological WPV within the previous year.

On the basis of these responses, each participant was classified as having had the experience of (1) physical WPV only, (2) psychological WPV only, (3) both physical and psychological WPV, or (4) no experience of WPV within the previous year. Physical and psychological WPV are not mutually exclusive. To measure prevalence and risk factors for physical WPV, participants who had experienced physical WPV, regardless of whether they had also experienced psychological WPV, were designated as cases. Psychological WPV was treated in the same manner. The multivariate analyses to examine potential predictors of WPV were conducted separately for physical and psychological WPV.

Other Measures

The framework for this study was the Haddon matrix,[33,34] which applies the principles of public health to prevent or minimize the consequences of injuries. The model is organized by phase of the injury event: preevent, event, and postevent and by the four potential targets for intervention strategies: host, agent or vehicle, physical environment, and social environment. Data collection, therefore, focused on characteristics of the individuals who experienced WPV (host), the source of violence (agent), and the physical and social settings in which the events occurred (environment). Participants provided demographic data and information about their work histories, such as position title and length of employment. Participants were asked about their experience with childhood and intimate partner violence (IPV) and with other types of violence not related to work. The agents, or perpetrators, consisted of patients, their relatives, or other employees (such as supervisors, physicians, or coworkers). With regard to setting, we determined participants' institutions and departments (ie, units of practice).

Statistical Analyses

Statistical tests were conducted using PASW Statistics 18 (SPSS Inc., IBM Corporation, Somers, New York).[35] Univariate statistics were used to describe the participants and their exposure to WPV. Bivariate chi-squared analyses were used to examine relationships between variables, including differences in outcomes between nurses and nonnurses, settings and hospital units. Finally, multivariate logistic regression using a backward stepwise approach was used to determine predictors of physical and psychological WPV.

RESULTS

Description of Study Respondents

Respondents (Table 1) consisted of *nurses* (75%) defined as registered nurses, clinical nurse specialists, nurse practitioners, and other nursing personnel (25%), including licensed practical nurses, clinical technicians, clinical or support associates, patient care technicians, and other nursing assistants. Similar to a national sample of nurses,[36] the majority (91.5%) were female. Nurses and nonnurses ranged in age from 18 to 71 years, with a mean age of 39.2 years (SD = 11.20), which is slightly younger than the national average age of nurses (mean = 46.8).[36] More than half were married (53.2%), white (61.4%), and four-year college graduates (54.2%). Respondents to this survey are more diverse, less likely to be married, and more well educated than nurses nationwide.[36] One-fourth reported a history of lifetime IPV, while 19% reported child physical abuse and 17% reported child sexual abuse. Participants were employed at one of four institutions, where more than half worked in one of three types of units: intensive care (23.6%), medicine (11.6%), and surgery (19.7%). More than half (58.2%) had been employed in their current position for five years or less.

Prevalence of WPV

Overall, 30% of respondents reported some form (physical or psychological) of WPV during the previous 12-month period, with a prevalence of 19.4% and 19.9% for physical and psychological violence respectively. Prevalence was higher for nurses as compared with nonnurses (Table 2), with a difference of 6.4% for psychological violence ($\chi^2 = 10.07$, $P = 0.002$), 8.1% for physical violence ($\chi^2 = 16.57$, $P < 0.001$), and 10.8% ($\chi^2 = 21.77$, $P < 0.001$) for any episode of WPV.

By site, the annual prevalence of any WPV ranged from 27.9 to 36.0 per 100 and differed significantly across sites ($\chi^2 = 8.13$, $P = 0.043$), with the highest rate at the geriatric care center and the lowest rate at the large urban medical center. Rates were approximately equal across sites for physical and psychological violence when measured alone. When examined by unit, the greatest annual prevalence per 100 workers was found for the emergency and psychiatry departments, with both units exceeding rates of 50/100 workers, followed by neurology at nearly 40/100, and long-term care or pediatrics with both units exceeding rates of 30/100.

Among nonnurses, prevalence did not differ by site for any of the three categories of WPV. Nevertheless, among nurses, there

TABLE 1. Demographic and Work-Related Characteristics of Sample

Variable	Category	Percentage of Sample
Age, yrs (mean = 39.2, standard deviation = 11.20)	18–19	0.4
	20–29	24.8
	30–39	28.2
	40–49	24.6
	50–59	18.5
	60–69	3.4
	70 and older	0.2
Marital status	Married	53.2
	Divorced	9.7
	Widowed	1.4
	Separated	2.5
	Never married	28.2
	Member of unmarried couple	5.0
Race	White	61.4
	Black/African American	22.8
	Asian/Pacific Islander	11.0
	Other	4.9
Education	Less than high school graduate	0.2
	High school graduate or GED	9.9
	Post–high school certification	3.4
	Two-year college	22.0
	Four-year college	54.2
	Masters degree	9.8
	Doctoral degree	0.5
History of trauma	Child abuse	18.6
	Child sexual abuse	17.3
	Lifetime intimate partner violence	24.8
Institution	Large urban medical center	57.2
	Midsize community hospital	27.2
	Small suburban community hospital	12.0
	Geriatric care center	3.6
Unit	Administration	1.2
	Emergency department	8.4
	Geriatrics/long-term care	3.3
	Critical care unit	23.6
	Medicine	11.3
	Neurology	1.8
	Obstetrics/gynecology	5.5
	Outpatient	8.8
	Pediatrics	4.8
	Psychiatry	7.8
	Surgery	19.7
	Other	3.6
Role	Registered nurse	72.8
	Clinical nurse specialist	1.2
	Nurse practitioner	0.9
	Licensed practical nurse	0.9
	Clinical technician	2.3
	Clinical associate	4.0
	Support associate	3.5
	Patient care technician	6.3
	Nurse associate	1.6
	Certified nursing assistant	1.3
	Certified medical assistant	0.9
	Other	4.6
Length of employment in current position	Less than 1 yr	23.1
	1–5 yrs	35.1
	6–10 yrs	16.8
	11–15 yrs	7.7
	16–20 yrs	8.4
	More than 20 yrs	8.9

Percentages may not total to 100% due to rounding.
GED, general equivalency diploma.

were differences across sites in prevalence of any WPV ($\chi^2 = 15.49$, $P = 0.001$) and psychological WPV alone ($\chi^2 = 11.46$, $P = 0.009$), but not for physical WPV alone. For nurses, reports of violence were consistently highest for the geriatric/long-term care facility, in some cases almost double the rates found for nurses in other facilities.

Nurses experienced greater overall rates of WPV compared with nonnurses in every clinical area and for all three violence classifications, with significantly greater overall WPV rates for nurses in the ED ($\chi^2 = 6.30$, $P = 0.015$), geriatrics/long-term care ($\chi^2 = 8.44$, $P = 0.004$), intensive care ($\chi^2 = 6.56$, $P = 0.010$), and psychiatry ($\chi^2 = 4.50$, $P = 0.048$). When data were further examined by specific classification of violence, differences between nurses and nonnurses in rates of psychological WPV were found for only the geriatrics/long-term care unit where nurses experienced a threefold increase in rates of psychological violence ($\chi^2 = 6.10$, $P = 0.018$). Prevalence for physical WPV was greater for nurses compared with nonnurses in four types of units: ED ($\chi^2 = 8.67$, $P = 0.003$), intensive care ($\chi^2 = 3.97$, $P = 0.046$), outpatient ($\chi^2 = 4.36$, $P = 0.040$), and psychiatry ($\chi^2 = 4.78$, $P = 0.032$).

Perpetrators of WPV

Respondents who had experienced WPV were asked to signify the perpetrator(s) (could be more than one) of the most recent incident of physical and/or psychological WPV. Among those who experienced physical violence, almost all incidents (90.2%) involved a patient as perpetrator, followed by a patient's relative (27.0%). More than 10% of the incidents involved another perpetrator, including coworkers (7.6%), physicians (1.5%), and supervisors (1.7%). In contrast, only slightly more than half (54.0%) of those who experienced psychological violence indicated that the patient perpetrated the violence, with 32.8% reporting a patient's relative. Approximately one-third (35.5%) of the participants reported an incident of psychological WPV with a coworker as perpetrator; 22.8% reported a physician as perpetrator, while for 11.3% it was their supervisor.

Risk Factors for WPV

Risk factors for physical and psychological WPV were examined in separate logistic regression analyses. Potential risk factors that were considered included demographic variables of gender, race, age, and marital status; previous experience with violence including child abuse, child sexual abuse (CSA), and lifetime IPV; and the work-related variables of profession (nurse vs nonnurse), work unit, and length of employment on the unit. None of these variables were found to be collinear; thus, all were included in the initial models. The decision to include all variables was also based on our theoretical framework indicating variables of interest *a priori*, and this approach allowed us to build our models using the same initial set of independent variables for both types of violence. As a result, two variables that were not associated with physical violence at the bivariate level, child abuse ($P = 0.44$) and age ($P = 0.40$), were

TABLE 2. Annual Prevalence per 100 Participants of Physical and Psychological Workplace Violence by Setting and Unit by Nurse/Nonnurse Role

	Any Workplace Violence*			Physical Workplace Violence			Psychological Workplace Violence		
	Nurse	Nonnurse	Overall	Nurse	Nonnurse	Overall	Nurse	Nonnurse	Overall
Setting†									
A	29.7	21.9	27.9	19.6	11.0	17.8	20.0	14.7	18.8
B	37.2	24.8	33.9	24.3	15.7	22.0	25.3	15.7	22.7
C	33.9	18.1	29.4	23.0	13.9	20.4	18.0	15.5	17.3
D	57.1	23.4	36.0	32.1	17.4	23.0	39.3	14.9	24.0
Overall	32.7	21.9	30.0	21.4	13.3	19.4	21.5	15.1	19.9
Unit									
Obstetrics/gynecology	13.3	0	10.9	5.1	0	4.2	11.2	0.0	9.2
Administration	31.3	18.2	25.9	12.5	9.1	11.1	25.0	9.1	18.5
Emergency department	60.6	39.1	54.9	53.5	28.3	46.8	37.8	27.3	35.1
Geriatrics/long-term care	55.6	21.4	34.8	29.6	17.1	22.1	37.0	11.9	21.7
Intensive care unit	29.2	16.1	26.7	18.2	9.7	16.6	17.7	10.8	16.4
Medicine	27.2	26.7	27.0	19.5	14.5	18.0	17.4	20.0	18.2
Neurology	47.8	26.7	39.5	34.8	6.7	23.7	34.8	26.7	31.6
Outpatient	23.4	11.4	20.5	9.2	0	7.0	20.6	11.4	18.4
Pediatrics	32.9	28.6	32.3	29.4	21.4	28.3	9.6	14.3	10.3
Psychiatry	59.3	40.5	54.5	50.4	31.0	45.5	38.2	21.4	33.9
Surgery	23.1	14.3	21.0	8.5	6.1	8.0	18.0	11.2	16.4
Other	48.0	29.2	41.9	28.0	25.0	27.0	32.0	20.8	28.4

*Includes those who experienced only physical, only psychological, or both types of workplace violence.
†A large urban medical center, B = midsized community hospital, C = small suburban community hospital, D = geriatric care center.

retained in both initial models as was gender, which was not associated with psychological violence ($P = 0.51$).

Physical WPV

The full model (Table 3) was significant ($\chi^2 = 239.01$, $P < 0.001$) with a nonsignificant Hosmer and Lemeshow test ($\chi^2 = 4.85$, $P = 0.77$). Overall, 77.4% of the sample was correctly classified by the final model, and the model provided significant fit ($\chi^2 = 233.35$, $P < 0.001$). Using the backward stepwise approach, both CSA and marital status were removed from the model. The final model showed a significantly increased risk of physical WPV for those whose length of employment was between 1 and 20 years compared with those employed for less than 1 year. Males were nearly twice as likely to have experienced physical WPV compared with females, the risk of physical WPV was 60% greater for nurses than nonnurses, Black/African American and Asian/Pacific Islander participants were less likely than white participants to experience WPV, and the risk increased with age. Those who had experienced child physical abuse and those who reported lifetime IPV were at 60% and 111%, respectively, greater risk of physical WPV. The obstetrics and gynecology department had the lowest risk of physical WPV and, therefore, was used as the referent category for administrative unit analysis. Risk was approximately nine times greater for those working in the emergency and psychiatry departments, and between four to five times greater for those in neurology, pediatrics, and those departments classified as "other."

Psychological WPV

The full model (Table 4) was significant ($\chi^2 = 118.75$, $P < 0.001$) with a nonsignificant Hosmer and Lemeshow test ($\chi^2 = 7.28$, $P = 0.51$). Using the final model, 75.4% of the sample was correctly classified, and the model provided significant fit ($\chi^2 = 115.04$, $P < 0.001$). Black/African American respondents were less likely to experience psychological WPV than white participants; although, unlike for physical WPV, gender and nurse status were nonsignificant, and the association with age was of borderline significance. Similar to physical WPV, marital status was nonsignificant. Respondents who experienced child physical abuse or CSA were 50% to 60% more likely to experience psychological WPV, and lifetime IPV increased risk for psychological WPV by nearly 90%. Finally, there was an increased risk of psychological WPV for those whose length of employment was 1 year or greater as opposed to less than 1 year.

LIMITATIONS

In addition to the differences in methodology and case definitions mentioned above, some potential limitations should be considered in the interpretation of these results. Participants may have been more inclined to volunteer for the study if they had experienced episodes of WPV. Attempts were made to reduce selection bias through active recruitment that reached all nursing personnel and strongly urged them to take part. Given the significant success of recruiting a large number of participants, only a 52% response rate was achieved. The proportion of nonnurse respondents was less than that in the general workforce across hospitals, possibly resulting in the high level of education and the relatively low proportion of males who took part. Respondents to this survey were more highly educated, younger in age, and more diverse than nurses, nationally[36] and across the mid-Atlantic states.[37–42]

The case status of some participants may have been misclassified because of inaccurate event recall. If such misclassification was undiferential (ie, the same proportion of cases and noncases were misclassified), the results would be biased toward the null, reducing power but not negating positive findings. If misclassification was differential, which is unknown, bias may have been introduced. The survey was offered in paper and electronic form to minimize the selection bias that may have occurred if those less familiar with computers declined to participate. Use of the electronic version alone

TABLE 3. Logistic Regression of Physical Workplace Violence on Selected Risk Factors

Risk Factor	Crude Odds Ratio (95% Confidence Interval)	Full Model Adjusted Odds Ratio (95% Confidence Interval)	Final Model Adjusted Odds Ratio (95% Confidence Interval)
Nurse	1.78 (1.34-2.35)	1.68 (1.09-2.58)	1.60 (1.05-2.44)
Gender−Male	1.81 (1.28-2.55)	1.69 (1.05-2.75)	1.90 (1.28-2.82)
Age	1.00 (.99-1.01)	0.98 (0.97-1.00)	1.64 (1.02-2.65)
Race			
White	1.00	1.00	1.00
Black	0.38 (0.26-0.54)	0.35 (0.22-0.57)	0.35 (0.22-0.57)
Asian/Pacific Islander	0.40 (0.24-0.64)	0.50 (0.29-0.86)	0.50 (0.29-0.86)
Other	0.90 (0.51-1.59)	0.85 (0.44-1.64)	0.86 (0.45-1.65)
Marital status			
Married	1.00	1.00	
Divorced	1.06 (0.73-1.54)	0.92 (0.53-1.60)	
Widowed	1.67 (0.73-3.83)	3.56 (1.19-10.70)	
Separated	1.88 (1.01-3.51)	1.38 (0.56-3.43)	
Never married	0.99 (0.76-1.28)	1.07 (0.74-1.55)	
Member: unmarried couple	1.77 (1.12-2.79)	1.18 (0.63-2.21)	
Trauma history			
Child physical abuse: yes	1.70 (1.26-2.28)	1.59 (1.11-2.29)	1.60 (1.13-2.28)
Child sexual abuse: yes	1.19 (0.86-1.64)	1.01 (0.68-1.50)	
Lifetime intimate partner violence: yes	1.93 (1.53-2.43)	2.11 (1.50-2.96)	2.11 (1.53-2.91)
Length of employment			
<1 yr	1.00	1.00	1.00
1−5 yrs	1.36 (1.01-1.82)	1.91 (1.29-2.83)	1.87 (1.26-2.77)
6−10 yrs	1.25 (0.88-1.78)	1.74 (1.07-2.84)	1.72 (1.07-2.78)
11−15 yrs	1.16 (0.74-1.82)	1.99 (1.01-3.89)	2.03 (1.05-3.96)
16−20 yrs	0.95 (0.60-1.52)	2.11 (1.09-4.09)	2.09 (1.08-4.01)
More than 20 yrs	0.83 (0.52-1.32)	1.87 (0.94-3.72)	1.81 (0.91-3.58)
Administrative unit			
Obstetrics/gynecology	1.00	1.00	1.00
Administration	0.56 (0.53-5.84)	0.48 (0.04-5.27)	0.52 (0.05-5.66)
Emergency department	9.14 (2.63-31.78)	9.11 (2.53-32.77)	9.37 (2.61-33.64)
Geriatrics/long-term care	2.87 (0.72-11.38)	3.88 (0.91-16.46)	4.19 (1.00-17.62)
Intensive care unit	2.16 (0.63-7.37)	1.95 (0.56-6.88)	2.01 (0.57-7.05)
Medicine	2.91 (0.83-10.20)	3.41 (0.94-12.42)	3.53 (0.97-12.82)
Neurology	3.70 (0.86-15.93)	4.48 (0.98-20.58)	4.78 (1.05-21.76)
Outpatient	0.95 (0.25-3.63)	0.89 (0.22-3.53)	0.92 (0.23-3.64)
Pediatrics	4.71 (1.60-17.12)	4.57 (1.21-17.31)	4.74 (1.26-17.92)
Psychiatry	8.33 (2.39-29.08)	8.89 (2.45-32.30)	8.94 (2.47-32.37)
Surgery	1.03 (0.29-3.61)	1.08 (0.30-3.94)	1.12 (0.31-4.05)
Other	3.63 (0.96-13.68)	3.76 (0.96-14.79)	4.03 (1.03-15.77)
Model fit		$\chi^2 = 239.01, P < 0.001$	$\chi^2 = 233.35, P < 0.001$

could have skewed the representation of certain demographic groups such as the elderly or those with low levels of income. Finally, although every attempt was made to measure as many plausible confounding variables as possible, it is always possible that others exist.

DISCUSSION

The prevalence of physical WPV against nurses and nursing personnel of 19.4% was within the range (9.5%–31.7%) of other large studies of general medical institutions.[4,8–12,14,15,17] The prevalence of physical WPV among the nurses surveyed is comparable to that reported in a large statewide sample in Minnesota[14] and among a sample of nurses across seven state nursing associations.[8] Although the prevalence of psychological WPV (19.9%) was less than in other research (23.6%–96%),[4,8,9,12,14–16,19–23] the wide variance in prevalence points to broader definitional issues.[21] When psychological WPV is defined, definitions range from nonverbal mistreatment[43,44] to threats and sexual harassment.[16] Unlike in cases of physical violence, there may also be some ambiguity surrounding the interpretation of aggressive verbal and nonverbal behavior as WPV rather than ordinary interpersonal experiences at work.

The strongest risk factors in our multivariate analysis models for physical WPV were working in psychiatric units or EDs; this is similar to other research results.[4,9,11,14,15,24] Working on these units also increased the risk for psychological violence, though not significantly. The Emergency Nurses Association identified risk factors to explain the high prevalence of violence in these settings.[45] Possible explanations include patient characteristics (access to firearms and substance abuse), environmental factors (poor security, overcrowding, wait times, and uncomfortable surroundings), or staff characteristics (lack of training and lack of adequate staffing). In addition to these factors, in psychiatric locations, other factors associated with risk have included the number of patients in a ward, patients

TABLE 4. Logistic Regression of Psychological Workplace Violence on Selected Risk Factors

Risk Factor	Crude Odds Ratio (95% Confidence Interval)	Full Model Adjusted Odds Ratio (95% Confidence Interval)	Final Model Adjusted Odds Ratio (95% Confidence Interval)
Nurse	1.54 (1.18-2.01)	1.22 (0.82-1.82)	
Gender: male	1.14 (0.78-1.66)	0.94 (0.58-1.53)	
Age	1.02 (1.01-1.02)	1.00 (0.99-1.02)	1.01 (1.00-1.02)
Race			
White	1.00	1.00	1.00
Black	0.53 (0.37-0.74)	0.52 (0.34-0.81)	0.45 (0.31-0.66)
Asian/Pacific Islander	0.62 (0.40-0.96)	0.81 (0.50-1.33)	0.84 (0.52-1.36)
Other	1.15 (0.66-1.99)	1.08 (0.59-1.97)	1.08 (0.59-1.97)
Marital status			
Married	1.00	1.00	
Divorced	1.08 (0.75-1.54)	0.87 (0.53-1.42)	
Widowed	0.78 (0.29-2.05)	0.92 (0.30-2.84)	
Separated	1.08 (0.54-2.14)	0.60 (0.23-1.52)	
Never married	0.72 (0.55-0.93)	0.87 (0.61-1.25)	
Member of unmarried couple	1.34 (0.63-1.70)	0.87 (0.46-1.66)	
Trauma history			
Child physical abuse: yes	1.71 (1.33-2.21)	1.51 (1.08-2.11)	1.53 (1.10-2.14)
Child sexual abuse: yes	1.79 (1.38-2.32)	1.57 (1.10-2.24)	1.60 (1.12-2.28)
Lifetime intimate partner violence: yes	2.02 (1.60-2.54)	1.92 (1.40-2.63)	1.86 (1.38-2.53)
Length of employment			
< 1 yr	1.00	1.00	1.00
1−5 yrs	1.28 (0.95-1.73)	1.46 (1.00-2.13)	1.49 (1.03-2.18)
6−10 yrs	1.65 (1.17-2.33)	1.92 (1.23-3.00)	2.05 (1.34-3.16)
11−15 yrs	1.32 (0.85-2.07)	1.75 (0.95-3.23)	1.93 (1.08-3.45)
16−20 yrs	1.36 (0.88-2.10)	1.64 (0.90-2.97)	1.85 (1.06-3.24)
More than 20 yrs	1.16 (0.75-1.80)	1.71 (0.93-3.14)	1.92 (1.11-3.32)
Administrative unit			
Obstetrics/gynecology	1.00	1.00	1.00
Administration	0.42 (0.10-1.81)	0.37 (0.08-1.72)	0.36 (0.08-1.65)
Emergency department	1.31 (0.56-3.07)	1.42 (0.58-3.46)	1.32 (0.54-3.19)
Geriatrics/long-term care	0.48 (0.16-1.38)	0.54 (0.17-1.68)	0.50 (0.16-1.53)
Intensive care unit	0.53 (0.24-1.20)	0.51 (0.22-1.20)	0.49 (0.21-1.45)
Medicine	0.61 (0.26-1.45)	0.73 (0.29-1.80)	0.69 (0.28-1.70)
Neurology	0.95 (0.31-2.92)	1.18 (0.36-3.84)	1.10 (0.34-3.56)
Outpatient	0.59 (0.25-1.43)	0.55 (0.22-1.39)	0.55 (0.22-1.38)
Pediatrics	0.27 (0.09-0.75)	0.32 (0.11-0.94)	0.30 (0.10-0.88)
Psychiatry	1.10 (0.46-2.58)	0.99 (0.40-2.45)	0.95 (0.39-2.34)
Surgery	0.44 (0.19-1.02)	0.49 (0.51-1.17)	0.47 (0.20-1.11)
Other	0.85 (0.33-2.22)	0.77 (0.28-2.12)	0.75 (0.28-2.06)
Model fit		$\chi^2 = 118.75, P < 0.001$	$\chi^2 = 115.04, P < 0.001$

with a history of violence, number of female staff, and number of staff without appropriate training.[46] One study of nursing personnel asked nurses to identify the cause of abuse or assault by patients. The most common precipitating factors identified were those most frequently seen in psychiatric units: cognitive dysfunction (including head injury, dementia, and developmental delay) (79.1%) and substance abuse (60.5%).[6]

Unlike in this study, increased risk for physical violence in pediatrics and neurology has not been found in previous research. Patients in neurology may be more likely to commit violence if they have head injuries, which make them disinhibited or impulsive, and children may react to painful procedures by scratching or biting. Further research should be conducted to fully understand the circumstances and types of violence occurring in these departments.

Other studies similar to this one have found that male nurses are more likely to report WPV.[9,12,14,47,48] There is, nevertheless, limited data analyzing gender differences and WPV.[49] Other researchers have explained this gender difference by hypothesizing that males have greater exposure to violent patients, or there may be a tendency for males to feel more protective of female staff.[14,47] Post-hoc analyses found that males were more likely to work in the psychiatric unit ($\chi^2 = 21.745$, $P < 0.01$), a setting associated in this and previous research with an increased risk for work-related violence.[4,9,11,13–15] Male nurses and nursing personnel were also significantly less likely to work the day shift ($\chi^2 = 21.179$, $P < 0.0001$); working irregular/night shifts has also been found in previous research to increase the risk for WPV.[2,9,11]

Additional differences were found in the prevalence of psychological violence by site; similar to previous research,[9,11,13,14,16] participants at the geriatric care center reported more psychological violence. This is likely due to the increased levels of confusion, dementia and Alzheimer disease among these patients. Nevertheless, previous research has found that environmental factors (eg, lighting, personal telephone) not examined in this study may affect WPV.[13] Further research should be conducted to ascertain if it is the patient population, the environment, or other factors that increase the risk to nurses/nursing personnel in certain departments/locations.

Contrary to previous research,[9,11,24] nurses in this study were more likely to be victims of physical WPV than nonnurses, though this varied by department in bivariate analyses. Future research should further examine the interaction between position and department, and position in conjunction with responsibility for patient care as nurses with direct patient care responsibilities are at higher risk for WPV.[13,24] The risk of physical and psychological WPV increased with age in this study, though the opposite effect was found in previous research.[9,11,24] Length of employment had an effect on both physical and psychological WPV in this research, but had no effect on risk for WPV in previous studies.[13,24] In general, longer length of employment increases risk for WPV in this study, though this was not a linear relationship. Finally, contrary to previous research examining risk factors for violence,[24] race/ethnicity affected physical and psychological WPV in this study, though this may be due to the diversity of the workforce in this research. In a single study, when asked to report their perceptions, nurses reported that 41.9% of the physical and/or verbal assaults they experienced were related to racial tension.[6] Thus, it is imperative that the findings of this research be examined qualitatively and with attention to institutional barriers, nurse-patient racial dyads and recognition of workplace incivility[50,51] as WPV to better understand the factors underlying this finding.

The prevalence of IPV and childhood abuse among nurses and nursing personnel in this study is similar to previous research. A national study found the lifetime prevalence of IPV to be nearly 25% in US women.[52] Childhood abuse prevalence estimates are generally in the range of 13.5% for CSA and 19.7% for physical abuse in relatively representative US female samples.[53,54] Only a single study has examined the relationship of trauma history to WPV,[31] even though many investigations of other forms of violent victimization have found early violence experiences to be risk factors for later violence.[55–57] This research found childhood maltreatment and lifetime IPV to increase the likelihood of both physical and psychological WPV. The relationship between past and current victimization is commonly thought to be mediated by posttraumatic stress disorder (PTSD). The numbing and/or hyperarousal symptoms of PTSD are thought to impede risk recognition in various ways.[58,59] The hypervigilance symptom of PTSD may also negatively affect the ability of nursing personnel to make calming responses to aggressive behavior on the part of patients. Future research should examine the effects of additional types of violence (ie, stranger violence) on experiences of WPV and examine the relationship between PTSD and experiences of WPV.

This is one of the largest US studies to examine the risk factors for experiencing WPV, including interpersonal violence, among nurses and nursing personnel in across hospital settings. Future research is needed to replicate these findings within the United States and to aid in understanding WPV among nurses and nursing personnel, a segment of the population at high risk for WPV. Further examinations of the relationship between childhood experiences of violence, IPV, and WPV are especially relevant among female workers.

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