

Workplace Homicides Among U.S. Women: The Role of Intimate Partner Violence

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PURPOSE: Intimate partner violence (IPV) is an important public health issue with serious consequences for the workplace. Workplace homicides occurring to U.S. women over a 6-year period, including those perpetrated by an intimate partner, are described.

METHODS: Workplace homicides among U.S. women from 2003 to 2008 were categorized into type I (criminal intent), type II (customer/client), type III (co-worker), or type IV (personal relations) events using the Census of Fatal Occupational Injuries. Fatality rates were calculated and compared among workplace violence (WPV) types, occupations, and characteristics including location of homicide, type of workplace, time of day, and weapon used.

RESULTS: Between 2003 and 2008, 648 women were feloniously killed on the job. The leading cause of workplace homicide for U.S. women was criminal intent, such as robbing a store ($n = 212$; 39%), followed by homicides perpetrated by a personal relation ($n = 181$; 33%). The majority of these personal relations were intimate partners ($n = 142$; 78%). Over half of workplace homicides perpetrated by intimate partners occurred in parking lots and public buildings ($n = 91$; 51%).

CONCLUSIONS: A large percentage of homicides occurring to women at work are perpetrated by intimate partners. WPV prevention programs should incorporate strategies to prevent and respond to IPV. *Ann Epidemiol* 2012;22:277–284. Published by Elsevier Inc.

KEY WORDS: Homicide, Workplace, Women, Domestic violence.

INTRODUCTION

In the United States, workplace injury fatalities have decreased 27% since 1992 with the greatest declines observed for workplace homicides (1). In 2010, 506 homicides occurred in U.S. workplaces, representing the lowest total ever recorded by the census (2). Despite these declines, in 2010, workplace homicides among women were up 13% and homicide remains a leading cause of occupational injury death for U.S. women (2). In an effort to better understand workplace violence (WPV), researchers have divided WPV events into four categories, based on the relationship of the perpetrator with the employee: Type I (criminal intent), type II (customer/client), type III (co-worker), and type IV (personal relations) (3–5). Although some of the early WPV studies found the type IV events were not common in the workplace, many of these studies did not analyze workplace typology across gender; therefore, the results

were heavily weighted toward men's experiences with WPV (6–8). The few studies that performed gender-specific analyses focusing on the perpetrators of workplace homicides found that women were significantly more likely to be killed on the job by intimate partners than men; however, these published reports are limited to individual states or cities (9, 10). The role that intimate partners play in the fatal WPV experience of women is relatively unknown.

Over one third of U.S. women (35.6%) have experienced rape, physical violence, and/or stalking by an intimate partner in their lifetime (11). Intimate partner violence (IPV) can follow women into the workplace, resulting in serious consequences not only for the victim, but for her co-workers as well. Each year, an estimated 13,000 acts of violence are committed by intimate partners against women while at work (12). The vast majority of women who experience IPV-related violence on the job have increased absenteeism and reduced work productivity (13). In an average year, employees experiencing IPV lose more than 8 million workdays and approximately \$18 million in annual earnings owing to job loss or absenteeism (14).

To the best of our knowledge, no national published report examines the typology of workplace homicides among U.S. women. Furthermore, a national analysis of workplace homicides among U.S. women has not been reported in more than 20 years (15). To address the need for more comprehensive data on the epidemiology of workplace

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Selected Abbreviations and Acronyms

BLS	Bureau of Labor Statistics
CFOI	Census of Fatal Occupational Injuries
CI	confidence interval
EAP	Employee Assistance Program
IPV	intimate partner violence
RR	rate ratios
WPV	workplace violence

homicides among women, an analysis using six years of data from the Census of Fatal Occupational Injuries (CFOI) was conducted. The primary purpose of this was to categorize workplace homicides occurring to U.S. women into the four types of WPV using perpetrator data obtained from the narrative text fields. In this paper, the characteristics of these homicides, including those perpetrated by an intimate partner at the victim's workplace, are described.

METHODS

Data Sources

Workplace homicides among U.S. women from 2003 through 2008 were examined using the CFOI. Data from 2003 to 2008 were selected for this analysis to utilize the most recently available data while using a consistent set of occupation categories. CFOI considers 2003 to be a break in series for the coding of occupation because the classification system changed in 2003. The CFOI is maintained by the Bureau of Labor Statistics (BLS) and is the most comprehensive and timely source of U.S. workplace injury death data. The BLS defines fatal work-related injury as those fatalities occurring to noninstitutionalized persons who were working at the time of the incident, and on the premises of their employer or other places while on the job. The BLS identifies and compiles all U.S. fatal work-related injuries using multiple administrative documents including death certificates, workers' compensation reports, medical examiner reports, Occupational Safety and Health Administration investigation reports, and police reports. Two or more source documents are required to confirm that a fatality was work related. The CFOI includes data on fatal work injuries from all 50 states and the District of Columbia. The data used in this analysis originated from restricted access research files under a memorandum of agreement between BLS and the National Institute for Occupational Safety and Health.

Denominator data for the calculation of fatality rates was obtained from the BLS's Current Population Survey. The Current Population Survey is a monthly household survey of approximately 50,000 civilian, noninstitutionalized residents that provides information on their employment, occupation, industry, and a variety of other work-related

characteristics (16). The Current Population Survey includes wage and salary workers, the self-employed, part-time workers, and unpaid workers in family-oriented enterprises such as farms (16). The number of annual female workers was extracted from this database.

Variables

Workplace homicides were identified using the Occupational Injury and Illness Classification System codes (17). This classification system, developed by the BLS, provides detailed codes for the nature of injury, body part affected, source of injury, and injury event or exposure (17). For this study, the following event codes were used to define workplace homicide: 6000, assaults and violent acts, unspecified; 6100, assaults and violent acts by person, unspecified; 6120, hitting, kicking, beating; 6130, shooting; 6150, stabbing; and 6190, assaults and violent acts by persons, not elsewhere classified. Homicides were then further categorized into the four types of WPV using information derived from the CFOI narrative text by two independent coders using a systematic methodology (3):

- Type I (criminal intent): The perpetrator had no legitimate relationship with the employee or the business and was committing a crime, such as robbery or trespassing, in conjunction with the homicide.
- Type II (customer/client): The perpetrator had a legitimate relationship with the employee or business and became violent while using the services of the business. Perpetrators can include customers, clients, patients, students, and inmates.
- Type III (co-worker): The perpetrator was a current or former employee of the business.
- Type IV (personal relations): The perpetrator had a personal relationship with an employee (includes domestic violence occurring in the workplace).

If the coders disagreed on the categorization of a homicide, circumstances of the fatality were described to the co-authors and a group decision was made. Because the WPV categories are not necessarily mutually exclusive, several specific coding rules were developed. Homicides perpetrated by co-workers who were also a relative or intimate partner of the decedent were categorized as type III (co-worker). Homicides perpetrated by a person hired by an intimate partner (a "hitman") were considered type IV events (personal relations). All homicides perpetrated by an intimate partner were further coded into current spouse, ex-spouse, other current intimate partner, or other ex-intimate partner using the narrative text variables. After categorization was complete, all homicides were manually examined for accuracy using the narrative text fields for a final quality control step. Six-hundred forty-eight workplace homicides occurred to U.S. women

between 2003 and 2008 and there were sufficient details in the narrative text to categorize 84% of these homicides ($n = 544$).^{*} WPV type could not be determined for 104 homicides (16%).

Major occupational groups were defined using the 2000 Standard Occupational Classification system. This system classifies occupations based on work performed, skills, education, training, and credentials. All occupations are clustered into 1 of 23 major groups (18).

Statistical Analysis

Workplace homicide rates were calculated as the total number of workplace homicides among U.S. women during this period divided by the estimated number of working women during this period and expressed as the number of fatalities per million workers. Fatality rates were calculated and compared between the four types of WPV and major Standard Occupational Classification occupations. Socio-demographics of the decedent (age, race, and ethnicity) and workplace characteristics (government status) were also compared with rate ratios (RRs) and 95% confidence intervals (CI). Differences between characteristics and WPV typology were compared with the Pearson Chi-Square statistic and exact procedures where appropriate. All P values were adjusted for multiple comparisons using the Bonferroni correction and adjustment procedure from 0.05 to 0.007. Analyses were performed with SAS, version 9.2 (SAS Institute, Cary, NC, 2008).

RESULTS

Between 2003 and 2008, 648 workplace homicides occurred among U.S. women, resulting in an overall fatality rate of 1.63 per 1,000,000 workers (Table 1). There were sufficient details in the narrative text to categorize 84% of these homicides ($n = 544$; Table 1). Of these homicides, 39% were type I events ($n = 212$), 33% were type IV ($n = 181$), 14% were type III ($n = 77$), and 14% were type II ($n = 74$). Of the type IV homicides, nearly 80% were perpetrated by an intimate partner ($n = 142$). Of the 142 IPV-related workplace homicides, 57% ($n = 81$) were perpetrated by a current or former spouse and 43% ($n = 61$) by an unmarried current or former intimate partner (data not shown).

There were no differences in homicide rates among age categories with respect to overall workplace homicide; however, significant differences in the proportion of homicides between age categories and the types of WPV were

TABLE 1. Number and rate of workplace homicides among U.S. women by workplace violence typology: CFOI, 2003–2008

Type	N (%)	Rate per 1,000,000 female workers per year
I, Criminal intent	212 (39)	0.53
II, Customers or clients	74 (14)	0.19
III, Worker-on-worker	77 (14)	0.19
IV, Personal relations	181 (33)	0.45
Non-IPV	39 (7)	0.10
IPV	142 (26)	0.36
Total*	544	1.63

CFOI = Census of Fatal Occupational Injuries; IPV = intimate partner violence.

*There were 104 “undetermined” fatalities removed from table; rate is based on total number of homicides ($n = 648$).

found ($p < .0001$; Table 2). For women between the ages of 25 and 34 and 35 and 44, type IV homicides were the most frequent (43% and 44%, respectively); however, for women between the ages of 45 and 54 and those older than 55 years of age, type IV homicides were the most frequent (45% and 60%, respectively; $p < .0001$). Non-white women had significantly higher overall workplace homicide rates than white women (RR = 1.7; 95% CI, 1.4–2.0), but there were no differences across the types of WPV ($p = .063$). Hispanic women also had significantly higher workplace homicide rates than non-Hispanic women (RR = 1.7; 95% CI, 1.4–2.0) and there were no differences across the types of WPV ($p = .045$).

Workplace homicide rates among women were significantly higher in private than in federal, state, or local workplaces (RR = 1.8; 95% CI, 1.4–2.3). A significantly greater proportion of type I and IV workplace homicides were found in private workplaces than in federal, state, or local workplaces ($p < .0001$). Firearms were used in 67% of the workplace homicide, overall ($n = 434$), followed by knives or other sharp objects ($n = 114$ [18%]; data not shown). The remaining homicides were owing to strangulation, blunt force trauma, or fire ($n = 99$ [15%]). A significantly larger percentage of type IV homicides were caused by firearms ($n = 143$ [80%]), whereas, more than half of type II homicides were because of stabbing, strangulation, blunt force trauma, or fire ($n = 42$ [56%]; $p < .0001$).

Figure 1 displays the rate of workplace homicides and the proportion of WPV types by occupation. Among those occupations with 20 or more homicides in the 6-year period, women in protective services had the highest workplace homicide rate and those in sales had the second highest rate (8.0 and 3.9 per 1,000,000, respectively; Figure 1). Although these occupations had the highest workplace homicide rates, they also had the lowest percentage of type IV events (16%). Nearly 50% of workplace homicides among women in healthcare and production occupations were perpetrated by a personal relation (46% and 52%, respectively).

The homicides took place in a variety of workplace settings (Table 3). The most frequent locations were retail

*The CFOI narrative is an unpublished text field used by BLS to verify coded data fields; narratives are only available with access to the CFOI research file. Because this is not a published field, presented numbers cannot be replicated by BLS and should not be considered official BLS statistics.

TABLE 2. Sociodemographics and workplace characteristics of workplace homicides among U.S. women by workplace violence typology: CFOI, 2003-2008

	Type I N (%)	Type II N (%)	Type III N (%)	Type IV N (%)	Total [§]	Rate per 1,000,000 female workers per year*	Rate ratio (95% CI) [†]	p value [‡]
Age (yrs)								<.0001
≤24	26 (41)	8 (14)	7 (11)	23 (36)	64 (12)	0.14	0.8 (0.6, 1.0)	
25-34	38 (32)	11 (9)	19 (16)	51 (43)	119 (22)	0.17	1.0 (0.8, 1.3)	
35-44	41 (27)	19 (12)	25 (16)	68 (44)	153 (28)	0.19	1.1 (0.8, 1.4)	
45-54	52 (45)	19 (16)	16 (14)	29 (25)	116 (21)	0.14	0.8 (0.6, 1.0)	
≥55	55 (60)	17 (18)	10 (11)	10 (11)	92 (17)	0.17	1.0	
Race								.063
White	140 (36)	61 (16)	55 (14)	130 (34)	386 (71)	0.14	1.0	
Non-white/unknown	72 (46)	13 (8)	22 (14)	51 (32)	158 (29)	0.24	1.7 (1.4, 2.0)	
Hispanic								.045
Non-Hispanic/unknown	182 (34)	68 (13)	59 (11)	147 (27)	456 (84)	1.51	1.0	
Hispanic	30 (26)	6 (5)	18 (16)	34 (30)	88 (16)	2.52	1.7 (1.4, 2.0)	
Government status								<.0001
Federal, state, local	13 (20)	22 (34)	14 (22)	15 (23)	64 (12)	1.05	1.0	
Private	199 (41)	52 (11)	63 (13)	166 (35)	480 (88)	1.94	1.8 (1.4, 2.2)	
Total	212	74	77	181	544			

CFOI = Census of Fatal Occupational Injuries.

*Rate is based on the total number of homicides, which includes those 104 homicides which could not be classified regarding type.

†Bold face type denotes statistical significance of rate ratios.

‡Bold numbers indicate significance for the Bonferroni adjustment ($p = .007$).

§Number in parentheses is the column percentage.

business establishments including restaurants, cafes, convenience stores, hotels, and motels ($n = 135$ [25%]), followed by commercial stores ($n = 103$ [19%]) and parking lots/garages ($n = 74$ [14%]). The location of the workplace homicide differed among the types of WPV ($p < .0001$). The most frequent locations for type I and type III homicides were retail establishments ($n = 73$ [34%] and $n = 23$ [30%, respectively]) and “home” for type II homicides ($n = 25$ [34%]). Over 60% of the workplace homicides that occurred at home were to home healthcare aides or real estate professionals. The largest percentage of type IV homicides occurred in parking lots/garages and public buildings ($n = 48$ [27%] and $n = 43$ [24%, respectively]). There were also significant differences in the time of the workplace homicides among the types of WPV (data not shown; $p = .0016$). Although a large proportion of the type I and III homicides occurred in the evening and late night hours (from 4 PM and midnight; $n = 79$ [37%] and $n = 23$ [30%, respectively]), most of the type II and IV homicides occurred during normal business hours (8:00 AM to 4 PM; $n = 30$ [41%] and $n = 97$ [54%]).

DISCUSSION

This research provides a national description of workplace homicides among U.S. women spanning a 6-year period. Despite the fact that homicide is the leading cause of occupational injury death for U.S. women, very little research

has focused on describing WPV among women. Additionally, IPV is rarely acknowledged as an element of WPV. Although 39% of women killed in the U.S. workplace were killed during a type I event such as a robbery, theft, or other criminal activity, type IV WPV homicides followed closely behind. Thirty-three percent of women killed in U.S. workplaces were killed by a known personal relation, of whom the majority were intimate partners. More U.S. women died on the job as the result of domestic violence than at the hands of a client such as a student, patient, or prisoner or by a current or former co-worker.

Women are murdered by someone they know 12 times as often as by a stranger (19). Based on the current study, these trends carry over into the workplace as well; a greater proportion of female workers are killed by someone they know personally than are male victims of workplace homicide (20, 21). Our findings also correspond with state- and city-based occupational homicide studies. An analysis of work-related homicides in North Carolina between 1977 and 1991 found that 75% of female homicide victims were killed by a current or former intimate partner (9). An examination of workplace homicides in Chicago also demonstrated an elevated risk of IPV-related homicide for women in the workplace—40% of the workplace homicides occurring to women over a 25-year period were perpetrated by an intimate partner (10). The last national analysis of work-related homicides among U.S. women did not describe the characteristics of the perpetrator, so to the best of our knowledge, this is the first such report (15).

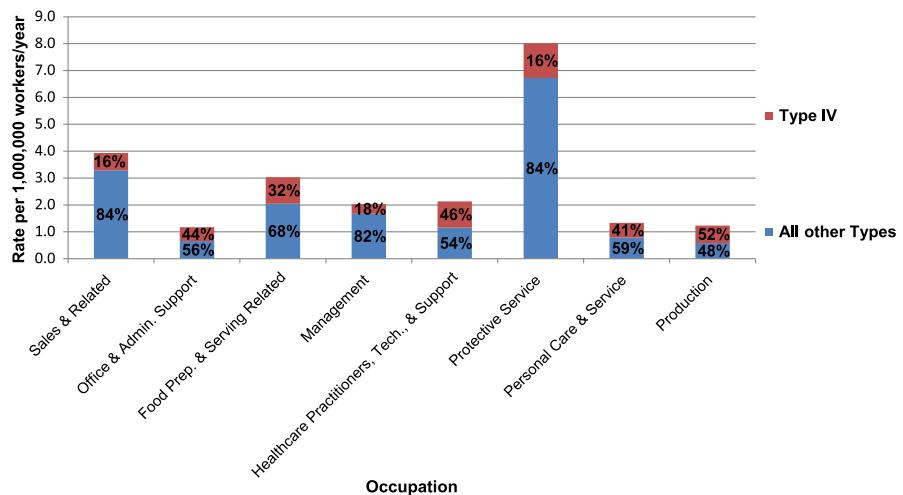


FIGURE 1. Rates of workplace homicides among U.S. women by selected occupation and typology: CFOI, 2003–2008. Only those occupations with 20 or more homicides in the 6-year period are included.

Although our results coincide with other data on fatal work-related IPV, there were differences between our findings and the most recent data on nonfatal, work-related IPV. Using 4 years of data from the National Crime Victimization Survey, Harrell (22) found that fewer than 2% of nonfatal WPV among women was committed by an intimate partner. There are two potential explanations for the discrepancy. First, the nonfatal, work-related IPV data in the Harrell (22) 2011 report should be interpreted with caution because it is based on fewer than 10 cases. Second, when respondents answer IPV questions within the context of crime victimization, such as in the National Crime Victimization Survey, there is a potential for undercounting events (23). When respondents are asked about IPV in a more behaviorally oriented manner, such as with the National Violence against Women Survey, they report higher incidences (23).

TABLE 3. Location of workplace homicides among U.S. women by workplace violence typology: CFOI, 2003–2008[†]

Location	Type I, n (%)	Type II, n (%)	Type III, n (%)	Type IV, n (%)	Total, n (%)
Other retail establishments*	72 (34)	11 (15)	23 (30)	29 (16)	135 (25)
Commercial store	61 (29)	-(-) [†]	-(-)	31 (17)	103 (19)
Parking lot/garage	13 (6)	5 (5)	8 (10)	48 (27)	74 (14)
Schools, office, other public buildings	28 (13)	14 (19)	18 (23)	43 (24)	103 (19)
Home	-(-)	25 (34)	-(-)	10 (6)	48 (9)
Prison/jails	-(-)	15 (20)	-(-)	5 (3)	24 (4)
Other	26 (13)	-(-)	-(-)	15 (9)	57 (10)
Total	212	74	77	181	544

*Includes restaurants, cafes, convenience stores, hotels, and motels.

[†]Dashed cells indicate censored cells that do not meet BLS reporting criteria of more than 5.

A finding of interest from this study was that Hispanic women had significantly higher work-related IPV fatality rates, even though studies have consistently show that IPV rates among Hispanics are similar or lower than rates for non-Hispanic whites (24). Our results do, however, coincide with data that demonstrates a higher work-related injury and assault risk among Hispanics compared with non-Hispanic whites (25, 26). Because workplace injury and assault risk are associated with factors correlated with race and ethnicity such as occupation, work schedule, union representation, health insurance, and job hours, disentangling these relationships can be problematic (27). To the best of our knowledge, no study has specifically examined racial or ethnic differences in WPV, controlling for these potential confounders. Further research is needed to evaluate possible reasons for the discrepancy between overall IPV rates and work-related IPV among Hispanics.

Important risk factors associated with work-related IPV were identified, including occupation, time of day, and location of these homicides, that may afford opportunities for intervention development and policy modifications. Among occupational groups, although women in protective service and sales occupations had the highest overall workplace homicide rate, a smaller percentage of these homicides were perpetrated by intimate partners, likely because of their high percentage of type I events. Occupations with the largest percentage of type IV workplace homicides were “Production,” “Healthcare,” “Office and administrative support,” and “Personal care and service.” There are two possible explanations for these findings. First, other types of homicide, such as type I, are less prominent in these occupations because these jobs are not associated with known workplace homicide risk factors such as the exchange of money, contact with customers, and delivery of services

(28, 29). Second, women employed in these occupations may work in locations where access into the business or workplace is poorly secured, such as hospitals, public office buildings, beauty salons, and factories. These types of workplaces may be the easiest locations in which a perpetrator can access his intimate partner (9).

Women were at an increased risk for type IV WPV events while walking to and from work in parking lots and garages and while in public buildings. This coincides with the results from a study on work-related fatal injuries in parking lots that demonstrated that 22% of women killed in parking lots at work, were killed by an intimate partner (30). These results point to simple prevention measures that employers could support to protect victims of IPV. For example, maintenance of adequate lighting in the parking lot, perimeter control, line of sight, separation of employee parking from the general public, and hiring security guards are recommended (30). Our findings may also reflect specific work disruption techniques reported in the literature (31). Galvez and colleagues (31) performed focus groups of immigrant and Mexico-origin Latino men enrolled in batterer intervention programs to study specific work-related IPV tactics (31). Several new IPV tactics emerged from these focus groups, including restricting their partner's use of automobiles and denying access to a driver's license (31). These findings may be applicable to other races and ethnicities and help to explain the high prevalence of work-related IPVs in parking lots and garages.

More than half of the IPV-related workplace homicides occurred during the day. Although this finding may be a reflection of the normal work hours of the highest risk occupations, it is important to note that the majority of these homicides occurred during normal daytime operating hours. Historically, the highest risk time for the occurrence of a workplace homicide, especially those of a criminal nature, has been nighttime (32). Some of the most effective safety measures for the prevention of workplace homicides entail robbery prevention programs aimed at protecting solo and late-night workers (33). Currently, there is little empirical evidence to guide workplace interventions and safety measures regarding domestic violence (34).

Even though employers are aware of the impact that IPV places on their workplaces, they are often hesitant to address these issues. A survey of 100 senior executives from Fortune 1000 companies showed that 91% believed that domestic violence affected the working lives of their employees and 68% believed their company's financial performance would improve if domestic violence were addressed (35). However, very few U.S. workplaces consider domestic violence a part of WPV prevention. A national survey of WPV prevention policies found that while 44% of U.S. workplaces address domestic violence in their WPV programs, only 4% provide training on preventing domestic violence (36). These

percentages are even more striking among the high-risk industries such as healthcare. Among California health and hospice agencies, although more than half had any type of formal WPV prevention program in place, only 8% had measures to protect workers from domestic violence occurring on the job (37).

IPV in the workplace remains a complex issue for both employees and employers. Instituting policies that permit women to freely discuss matters of IPV would be advantageous. If employees were to divulge IPV to workplace management and provide information when stalking or estrangement occurs, interventions could be utilized to protect the employee and the organization from intimate partner homicide. However, mandating reporting of IPV is complicated. Despite documentation of positive outcomes resulting from violence disclosure to someone at work, many barriers exist including victim's fears of retaliation by the employer (e.g., dismissal) and a lack of training on the part of most workplace management for dealing with IPV (38, 39). The context of each individual situation also needs to be considered; for some women, disclosing IPV to their supervisor may increase her risk of imminent danger. Employers have identified best practice areas that make IPV-related workplace programs effective; however, these have never been scientifically evaluated (40). These include: "Lead from the top," "Set and enforce policies," "Train," "Offer real-life answers," "Make safety and security vital issues," "Wrestle with tough issues," "Communicate creatively," "Integrate education," "Create a supportive culture," and "Reach out" (40).

Recent research also highlights that the type of supervisor support desired by battered women in the workplace is dependent on the stage of behavior change the woman is in. Perrin et al (41) interviewed 133 women who had been physically or sexually abused by an intimate partner in the past year. Cluster analyses revealed three distinct clusters in that reflected the different stage of behavior change in an abusive relationship (41). Generally, women desired more support from supervisors as they moved from the precontemplation stage, to the transition stage, and finally breaking away from the abusive partner (41).

Another possible role that workplaces could play in the prevention of IPV is through the use of Employee Assistance Programs (EAPs). EAPs are a leading resource to confidentially assist employees with a variety of personal problems that impact their work performance. EAPs have been found effective in promoting good mental health, reducing at-risk drinking, and reducing drug use (42–44). However, a recent literature review only found nine articles discussing the role of EAPs in addressing IPV and the vast majority of these articles were descriptive (45). To date, the role of EAPs in reducing and preventing IPV remains an uncertain resource.

There is an important limitation to these data. Although the use of the narrative text field in occupational injury work is an important methodologic technique, it is highly dependent on the quality of the data (46). In this study, the narrative text fields were used to categorize workplace homicide typology. Although 84% of the homicides over the 6-year period were assigned a typology, there were 104 cases (16%) that could not be categorized owing to the limited information regarding the circumstances of the homicide. The effect of these unknown homicides on the proportions presented in this analysis is unknown; however, a recent BLS data compilation demonstrates that, over a 13-year period, 24% of workplace homicides among women were perpetrated by a relative or personal acquaintance (47). The BLS has access to specific details for each homicide and while their methodology for defining perpetrator status may differ from the one used in this study, this proportion (24%) is similar to our finding (33%) (47).

Domestic violence can spill over into the workplace and our findings indicate that women are killed on the job by intimate partners nearly as frequently as they are killed by strangers. Women are killed by their intimate partners while at work far in excess of women killed by clients and co-workers, which are more commonly dealt with in WPV prevention policies and programs. This analysis is an early step to the identification of circumstances and risk factors for IPV events in the workplace and points to a variety of opportunities for prevention. Given that many IPV victims are employed and spend a great deal of time at work, the workplace is an important area for intervention and protection. Reducing the prevalence of IPV remains a public health priority; however, how to best protect IPV victims while in the workplace remains unclear. Thus, research should be undertaken to better understand the segue between IPV and the victim's work such that effective interventions can be developed to assist both employees and employers on how to deal with the threat of intimate partner homicide and its consequences to not only the victim, but also her work organization.

REFERENCES

1. U.S. Bureau of Labor Statistics, U.S. Department of Labor, 2011. 2010 Census of Fatal Occupational Injuries (preliminary data). Available at: <http://www.bls.gov/iif/oshcfo1.htm#2010>. Accessed November 14, 2011.
2. U.S. Bureau of Labor Statistics, U.S. Department of Labor, 2011. Census of Fatal Occupational Injuries Summary, 2010. Available at: <http://www.bls.gov/news.release/cfoi.nr0.htm>. Accessed November 14, 2011.
3. Injury Prevention Research Center (IPRC). Workplace violence: A report to the nation. Iowa City: University of Iowa; 2001.
4. Howard J. State and local regulatory approaches to preventing workplace violence. *Occup Med*. 1996;11:293–301.
5. Peek-Asa C, Howard J, Vargas L, Kraus JF. Incidence of on-fatal workplace assault injuries determined from employer's reports in California. *J Occup Environ Med*. 1997;39:44–50.
6. Peek-Asa C, Erickson R, Kraus JF. Traumatic occupational fatalities in the retail industry, United States 1992–1996. *Am J Ind Med*. 1999;35:186–191.
7. Schaffer KB, Casteel C, Kraus JF. A case-site/control-site study of workplace violent injury. *J Occup Environ Med*. 2002;44:1018–1026.
8. Kraus JF, Blander B, McArthur DL. Incidence, risk factors, and prevention strategies for work-related assault injuries: a review of what is known, what needs to be known, and countermeasures for intervention. *Annu Rev Public Health*. 1995;16:355–379.
9. Moracco KE, Runyan CW, Loomis DP, et al. Killed on the clock: a population-based study of workplace homicide, 1977–1991. *Am J Ind Med*. 2000;37:629–636.
10. Beauchamp Hewitt J, Levin PF, Misner ST. Workplace homicides in Chicago: risk factors from 1965 to 1990. *AAOHN J*. 2002;50:406–411.
11. Black MC, Basile KC, Breiding MJ, Smith SG, et al. The National Intimate Partner and Sexual Violence Survey (NISVS): 2010 summary report. Atlanta, GA: National Center for Injury Prevention and Control; 2011.
12. Bachman R. National Crime Victimization Survey: violence and theft in the workplace. Tulsa, OK: Bureau of Justice Statistics; 1994.
13. Associates EDK. The many faces of domestic violence and its impact on the workplace. New York: EDK Associates; 1997.
14. Corso PS, Mercy JA, Simon TR, Finkelstein EA, Miller TR. Medical costs and productivity losses due to interpersonal and self-directed violence in the United States. *Am J Prev Med*. 2007;32:474–482.
15. Bell CA. Female homicides in United States workplaces, 1980–1985. *Am J Public Health*. 1991;81:729–732.
16. Bureau of Labor Statistics. BLS handbook of methods. In: Labor force data received from the Current Population Survey. Available at: http://www.bls.gov/opub/hom/homch1_a.htm. Accessed August 21, 2009.
17. Bureau of Labor Statistics. Occupational injury and illness classification manual. Washington, DC: U.S. Department of Labor; 1992.
18. Office of the PresidentOffice of Management and Budget. Standard Occupational Classification Manual. Lanham, MD: Bernan Associates; 2000.
19. Violence Policy Center. When men murder women: an analysis of 2008 homicide data. Available at: <http://www.iansa-women.org/sites/default/files/newsviews/wmmw2010.pdf>. Accessed May 4, 2011.
20. Hendricks SA, Jenkins EL, Anderson KR. Trends in workplace homicides in the U.S., 1993–2002: a decade of decline. *Am J Ind Med*. 2007;50:316–325.
21. Gurka K, Marshall S, Runyan C, Loomis D, Casteel C, Richardson D. Contrasting robbery- and non-robbery-related workplace homicide: North Carolina, 1994–2003. *Am J Prev Med*. 2009;37:17–23.
22. Harrell E. Workplace violence, 1993–2009: National Crime Victimization Survey and the Census of Fatal Occupational Injuries. Washington, DC: Bureau of Justice Statistics; 2011. Available at www.bjs.gov/index.cfm?3fty3dpbdetail%26iid%3d2377.
23. Tjaden P, Thoennes N. Full Report of the prevalence, incidence and consequences of violence against women. Washington, DC: U.S. Department of Justice, Office of Justice Programs, National Institute of Justice; 2000.
24. Klevens J. An overview of intimate partner violence among Latinos. *Violence Against Women*. 2007;13:111–122.
25. Shannon CA, Rosponda KM, Richman JA, Minich LM. Race, Racial discrimination, and the risk of work-related illness, injury, or assault: findings from a national study. *J Occup Environ Med*. 2009;51:441–448.
26. Richardson DB, Loomis D, Bena J, Bailer JA. Fatal occupational injury rates in Southern and Non-Southern states, by race and Hispanic ethnicity. *Am J Public Health*. 2004;94:1756–1761.
27. Berdahl TA. Racial/ethnic and gender differences in individual workplace injury risk trajectories: 1988–1998. *Am J Public Health*. 2008;98:2258–2263.
28. LaMar W, Gerberich SG, Lohman W, et al. Work-related physical assault. *J Occup Environ Med*. 1998;40:317–324.

29. Amandus HE, Hendricks SA, Zahm D, Friedmann R, Block C, et al. Convenience store robberies in selected metropolitan areas. Risk factors for employee injury. *J Occup Environ Med.* 1997;39:442-447.
30. Fayard GM. Work-related fatal injuries in parking lots, 1993-2002. *J Safety Res.* 2008;39:9-18.
31. Galvez G, Mankowski ES, McGlade MS, Ruiz ME, Glass N. Work-related intimate partner violence among employed immigrants from Mexico. *Psychol Men Masculin.* 2011;12:230-246.
32. Loomis D, Wolf SH, Runyan CW, Marshall SW, Butts JD. Homicide on the job: workplace and community determinants. *Am J Epidemiol.* 2001;154:410-417.
33. Loomis D, Marshall SW, Wolf SH, Runyan CW, Butts JD. Effectiveness of safety measures recommended for prevention of workplace homicide. *JAMA.* 2002;287:1011-1017.
34. Yragui NL, Mankowski ES, Perrin NA, Glass NE. Dimensions of support among abused women in the workplace. *Am J Community Psychol.* 2011;49:31-42.
35. Roper ASW. Corporate leaders on domestic violence awareness of the problem: how it's affecting their business and what they're doing to address it. New York: Liz Claiborne, Inc; 2002.
36. Bureau of Labor Statistics (BLS). Survey of workplace violence prevention. Available at: http://www.bls.gov/iif/osh_wpvs.htm. Accessed May 12, 2011.
37. University of North Carolina at Chapel Hill Injury Prevention Research Center. Violence against home and hospice workers. Summary Report to Participating Home Health and Hospice Agencies. Chapel Hill: Author; 2010.
38. Swanberg JE, Logan TK. Domestic violence and employment: a qualitative study. *J Occup Health Psychol.* 2005;10:3-17.
39. Swanberg JE, Logan T, Macke C. Intimate partner violence, employment, and the workplace: consequences and future directions. *Trauma Violence Abuse.* 2005;6:286-312.
40. Randel JA, Wells KK. Corporate approaches to reducing intimate partner violence through workplace initiatives. *Occup Environ Med.* 2003;3:821-841.
41. Perrin NA, Yragui NL, Hanson GC, Glass N. Patterns of workplace supervisor support desired by abused women. *J Interpers Violence.* 2011;26:2264-2284.
42. Nakao M, Nishikitani M, Shima S, Yano E. A 2-year cohort study on the impact of an Employee Assistance Programme (EAP) on depression and suicidal thoughts in male Japanese workers. *Int Arch Occup Environ Health.* 2007;81:151-157.
43. Osilla KC, Zellmer SP, Larimer ME, Neighbors C, Marlatt GA. A brief intervention for at-risk drinking in an employee assistance program. *J Stud Alcohol Drugs.* 2008;69:14-20.
44. Reynolds G, Shawn MS, Lehman W. Levels of substance use and willingness to use the employee assistance program. *J Behav Health Serv Res.* 2003;30:238-248.
45. Pollack KM, Austin W, Grisso JA. Employee assistance programs: A workplace resource to address intimate partner violence. *J Womens Health.* 2010;19:729-733.
46. McKenzie K, Scotta DA, Campbell MA, McClure RJ. The use of narrative text for injury surveillance research: a systematic review. *Accid Anal Prev.* 2010;42:354-363.
47. Bureau of Labor Statistics (BLS). Occupational homicides by selected characteristics, 1997-2009. Available at: http://www.bls.gov/iif/oshwc/cfoi/work_hom.pdf. Accessed May 12, 2011.