

Workplace violence victimization in young workers: An analysis of the US National Crime Victimization Survey, 2008 to 2012

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Abstract

Background: The aim of this study was to measure the frequency of workplace violence (WPV) victimization in 16 to 24-year olds in the United States and compare rates by occupation and demographics.

Methods: As an open cohort, participants 12 years or older in the National Crime Victimization Survey were interviewed at 6-month intervals over a 3-year period from 2008 to 2012. WPV victimization rates were calculated. Weighted, multilevel Poisson regression was used to compare WPV victimization rates by occupation and demographics.

Results: The rate of WPV victimization was 1.11 incidents per 1000 employed person-months (95% confidence interval: 0.95-1.27). The highest rates of WPV were in protective service occupations (5.24/1000 person-months), transportation (3.04/1000 person-months), and retail sales (2.29/1000 person-months). Compared with their respective counterparts, lower rates of WPV victimization were found among younger, black, and rural/suburban workers.

Conclusions: Findings identify occupations and target populations in need of future research and evidence-based interventions to improve the working conditions for young workers.

KEYWORDS

adolescence, industry, occupational injury, young adult

1 | INTRODUCTION

Labor market participation is the most common out-of-school activity among youth between the ages of 16 and 24 years,^{1,2} particularly during the summer months; approximately 19.2 million adolescents were employed during July 2013.³ A large proportion (27%-36%) of young workers are employed in the retail industry.⁴⁻⁸ On the basis of studies of primarily adults, workers in retail disproportionately experience higher rates of violence due to contact with the public, cash handling, and working late hours.^{9,10} For instance, businesses that experienced a homicide had up to 10.6 higher odds of being

within the retail industry, such as grocery or convenience stores, than other types of industries.^{10,11} Furthermore, among all occupational fatalities, workers under 20 years of age had twice the odds of being employed in retail than workers over age 20.¹² This suggests that a significant proportion of youth work in conditions that place them at increased risk for being a victim of violence.

Few studies have measured the magnitude of workplace violence (WPV) in youth populations. Surveys conducted of employed high school students from rural and urban areas reported that up to 33% experienced some form of WPV: 25% had been verbally threatened, 10% physically attacked,⁷ and up to 52% sexually harassed.^{7,8,13,14}

Females were more often the victims of WPV,⁷ particularly sexual harassment, compared to males.¹⁴ Perpetrators were identified as coworkers, mostly males older than 30 years, in 56% of sexual harassment reports^{7,8} while verbal threats and physical attacks were most often by customers.

The consequences of WPV are not limited to physical injuries or death but may result in the development of psychological symptoms. Teenage girls who reported sexual harassment at work had significantly higher scores on scales measuring work stress and job withdrawal, and were more likely to think about leaving their current position than girls who did not report sexual harassment.⁸ Teens who experienced bullying, verbal, or sexual harassment at work had significantly higher levels of school avoidance, academic withdrawal,^{8,15} low self-esteem, and depressive symptoms compared to employed teens who were not bullied or harassed.¹⁵

Despite the high percentage of youth employed in high-risk industries and occupations, no study to our knowledge has examined the characteristics of nonfatal WPV in a national sample of young workers. Using the National Crime Victimization Survey (NCVS) data set,¹⁶ a nationally representative survey that captures all types of nonfatal victimizations, we calculated the national rate of WPV victimization in young workers ages 16 to 24 years and compared rates across occupations and demographic characteristics. We also described incidents of WPV victimization and their consequences on young workers.

2 | METHODS

2.1 | Study design

A dynamic, retrospective cohort study of young workers was conducted using 2008 to 2012 data from the NCVS.

2.2 | Data source and study population

The NCVS¹⁶ is an open cohort panel survey of a nationally representative sample of residential units in the United States. The US Census Bureau administers the NCVS annually for the Bureau of Justice Statistics. NCVS is the primary source of information on the characteristics of personal and household victimizations and crimes used in the United States.

The source population consisted of US residents 12 years or older who were living in housing units selected for the NCVS from 2008 to 2012. All those 12 years or older within sampled households were interviewed every 6 months over the course of 3 years for a total of seven-panel interviews or time points. The initial interview was conducted in person while the remaining six were computer-assisted telephone interviews. The study population was restricted to all employed youth aged 16 to 24 captured by the NCVS from 2008 to 2012. Since most states allow youth 16 years or older to legally work as part- or full-time employees, we used age 16 as our lower age limit and 24 years as the upper limit. Including young adults up to the age of 24 captured the developmental transition from childhood to

adulthood more accurately¹⁷ and enabled us to capture young adults and new workers who may be just entering the workforce.

During each interview, the basic screening questionnaire form was used to determine if the respective household member was a victim of a crime over the last 6 months. If the respondent reported any form of victimization over the last 6 months, a criminal incident report form was completed for each incident.

2.3 | Study variables

2.3.1 | Employment & occupation

Employment status and occupation were the main exposures of interest. Employment status was operationalized based on responses to the following questions: "Did you have a job or work at a business during the last 6 months?" On the basis of this question, a dichotomized variable for current employment status (yes/no) was created. Occupation was defined based on the question, "Which of the following best describes your job?" Occupation was grouped into the following categories based on the responses listed on the basic screening questionnaire: health care/social, education, protective service/law enforcement, retail, transportation, and other.¹⁸ Medical professional and mental health services were combined into health care/social category. Protective services/law enforcement include detectives, guards, police officers, and firefighters. The geographic location of the workplace (eg, rural/urban) was also collected and defined according to the US Census Bureau urban/rural classification criteria. Urban areas or clusters were defined based on a population of at least 2500.¹⁹

2.3.2 | Demographic characteristics

Demographic characteristics such as age, gender, race/ethnicity, and household income were examined. Age was dichotomized into 16 to 19 and 20 to 24-year groups. Race/Ethnicity was categorized accordingly: white, black/African American, American Indian/Alaska Native, Asian, Native Hawaiian/Other Pacific Islands, Hispanic, or mixed. Household income, which was collected from the head of households, was analyzed as a categorical variable and used as a measure of socioeconomic status. The categories of income were created based on the quartile distribution in the entire population: less than \$25 000, \$25 000 to \$39 999, \$40 000 to \$74 999, and \$75 000 and over.

2.3.3 | Workplace violence victimization

The primary outcome, WPV victimization, was defined as any physical attacks, verbal threats, sexual assault or rape, robbery, or personal theft experienced "while at work or on duty" as determined by the question, "What were you doing when this incident happened/started?" The question "type of crime" was used to determine the nature of the crime (ie, physical attacks/attempt, theft, threat/verbal attack, attempted sexual assault, attempted rape/rape, and personal

theft). A dichotomized variable capturing WPV victimization (yes/no) was created.

2.3.4 | Incident characteristics

If participants reported being victimized “while at work or on duty”, the following information was collected: industry (ie, agriculture/forestry/fishing/mining, construction, manufacturing, wholesale trade, retail trade, finance/insurance/real estate, business/repair services, personal services, professional services (eg, scientific and technical services, and management enterprises), entertainment/recreation, transportation/communications/public utilities, and public administration/government); occupation (ie, skilled labor, health care and social service, education, protective services, personal care and service, food preparation and serving related, sales and related, transportation and material moving, office and administrative support, construction, and other); time of the incident (ie, day or night); usual time of work (ie, days, nights, or rotating shifts); weapons used (eg, gun or knife); relationship to the perpetrator (eg, relative or nonrelative); injuries related to the incident; and if the incident was reported to legal enforcement authorities. If the victim reported that they saw or knew the offender, relationship to the offender was collected. Larger categories for occupation and industry were created based on the responses listed on the criminal incident report form and the Alphabetical Indexes of Industries and Occupation.¹⁸

2.3.5 | Physical and psychological symptoms

Only victims of personal crimes (ie, rape, sexual attacks, robbery, physically or verbally assaulted) who reported the event to be moderately or severely distressing were then asked a series of questions about their physical or psychological symptoms following the incident: “Did you feel any of the following ways for a month or more? (eg, worried or anxious, angry, or depressed)” or “Did you experience any of the following physical problems: headaches, trouble sleeping, high blood pressures or fatigue etc?” If the respondent answered “yes” to any of the listed psychological and/or physical symptoms, they were asked if they sought professional or medical assistance. A variable was created and coded into the following mutually exclusive categories: psychological symptoms only, physical symptoms only, psychological and physical symptoms. In addition, we determined if victims of personal crimes sought medical/professional assistance.

2.4 | Statistical analysis

2.4.1 | Descriptive statistics

Descriptive statistics (frequencies and percent) were used to report the distribution of WPV victimization incidents and the different types and severity of psychological and physical symptoms displayed. *t* Tests were used to detect a significant difference between the number of WPV victimization incidents reported and all exposure variables and covariates of interest.

2.4.2 | Rate calculation

Person-months of employment were calculated based on the number of time points or surveys youth reported being employed, with a maximum of up to 42 person-months. Because individuals were followed longitudinally at each survey time point, each completed survey was a proxy for 6 months of employed person-time. Weighted rates of WPV victimization were calculated for the open study cohort over the 5-year period by dividing the number of events by total employed person-months. Weighted rates were also calculated and reported by occupation and demographic characteristics.

2.4.3 | Poisson regression

Weighted, multilevel Poisson regression models were used to compare the rates of WPV victimization by occupation and demographic characteristics. This analysis accounted for within-subject correlation due to repeated measures and the survey sample design when calculating standard errors. Weighted rates, crude and adjusted incidence density ratios (IDRs), and 95% confidence intervals (CIs) are reported. All analyses were conducted using Stata 13.

3 | RESULTS

3.1 | Demographic characteristics of the study population

From 2008 to 2012, an annual average of about 20 million (weighted) youth aged 16 to 24 years, reported working in the United States (Table 1). Fifty-two percent of this population were male, 63% were white, and half had household incomes less than \$25 000, annually. Nineteen percent were employed within retail sales occupations followed by 7% in health care and 3% in education/teaching occupations. Over 60% worked within an urban setting.

3.2 | Description of workplace violence incidents

The most frequent forms of victimization reported were personal theft at 53% and physical attack/attempt at 23% (Table 2). Twenty-nine percent of these incidents were reported to law enforcement. In 15% of incidents, the perpetrator used a weapon; the most frequently used weapon in all incidents was a handgun or other type of gun (37%).

3.3 | Who were the victims?

An estimated 1 019 691 youth experienced these incidents of WPV in the United States over the 5-year period (Table 3), corresponding to an average annual rate of 1.11 incidents per 1000 employed person-months. There was no statistically significant trend detected in the rate of WPV victimization from 2008 to 2012 ($P = .77$) (Figure 1). The majority of victims were employed within the entertainment and recreation (28%) or

TABLE 1 Unweighted and weighted proportions and average annual numbers of employed youth between ages 16 and 24 years, 2008-2012 National Crime Victimization Survey

| | 5-y unweighted N (%) | Percent (95% CI) ^a | Weighted average annual number (95% CI) |
|------------------------------------|----------------------|-------------------------------|---|
| <i>Youth characteristics</i> | | | |
| <i>Sex</i> | | | |
| Male | 10 788 (50.3) | 51.9 (51.0-52.8) | 10 156 666 (9 590 460-10 722 871) |
| Female | 10 658 (49.7) | 48.1 (47.2-49.0) | 9 409 604 (8 922 947-9 896 261) |
| <i>Race</i> | | | |
| White | 13 747 (64.3) | 62.8 (61.0-64.6) | 12 252 984 (11 400 688-13 105 280) |
| Black | 2258 (10.6) | 11.7 (10.8-12.8) | 2 295 093 (2 103 097-2 487 090) |
| Hispanic | 3969 (18.6) | 18.7 (17.3-20.1) | 3 641 280 (3 367 416-3 915 143) |
| Asian | 739 (3.5) | 3.7 (3.3-4.1) | 721 189 (646 919-795 458) |
| American Indian/ Alaskan Native | 149 (0.7) | 0.7 (0.5-0.1) | 134 208 (77 368-191 048) |
| Hawaiian/Pacific Islander | 68 (0.3) | 0.3 (0.2-0.4) | 58 252 (38 878-77 626) |
| Mixed | 457 (2.1) | 2.1 (1.9-2.4) | 407 279 (355 556-459 003) |
| <i>Household income, \$</i> | | | |
| <25 000 | 11 186 (52.2) | 51.5 (49.9-53.2) | 10 080 876 (9 388 483-10 773 269) |
| 25 000-39 999 | 3273 (15.3) | 14.8 (14.0-15.5) | 2 891 267 (2 682 093-3 100 441) |
| 40 000-74 999 | 3886 (18.1) | 18.2 (17.3-19.1) | 3 556 164 (3 333 906-3 778 421) |
| 75 000 and over | 3101 (14.5) | 15.5 (14.7-16.5) | 3 037 963 (2 860 600-3 215 326) |
| <i>Work characteristics</i> | | | |
| <i>Occupation^b</i> | | | |
| Health care and social assistance | 1414 (6.8) | 6.5 (6.1-6.9) | 1 305 627 (1 197 376-1 413 879) |
| Education/teaching | 702 (3.4) | 3.2 (2.9-3.5) | 642 923 (571 519-714 329) |
| Protective service/law enforcement | 239 (1.2) | 1.1 (0.98-1.3) | 223 014 (194 125-251 903) |
| Retail/sales | 3889 (18.7) | 19.3 (18.5-20.0) | 3 869 861 (3 649 564-4 090 159) |
| Transportation | 263 (1.3) | 1.4 (1.2-1.5) | 272 865 (241 211-304 518) |
| Other | 14 330 (68.8) | 68.6 (67.6-69.5) | 13 773 941 (13 140 069-14 407 812) |
| <i>Work Location</i> | | | |
| Urban | 13 089 (62.4) | 61.9 (60.5-63.4) | 11 896 107 (11 118 157-12 674 057) |
| Suburban | 3903 (18.6) | 19.2 (18.1-20.3) | 3 682 321 (3 455 993-3 908 648) |
| Rural | 1782 (8.5) | 8.5 (7.6-9.4) | 1 625 755 (1 466 629-1 784 882) |
| Combination | 2214 (10.6) | 10.4 (9.8-11.1) | 1 999 266 (1 827 531-2 171 001) |

^a95% Confidence intervals.^bOccupations collected using the basic screen questionnaire form.

professional services (24%) industry, and sales and related occupations (25%), at the time of the incident (Table 3).

In the subset of youth who experienced physical attacks, verbal threats, sexual assault or rape, and robbery, 12% found the incident to be moderately or severely distressing. Psychological symptoms were experienced by 67% of those distressed, while 33% experienced both physical and psychological symptoms. Approximately 14% of those distressed sought professional assistance.

3.4 | Factors associated with workplace violence victimization

Rates of WPV were highest among young workers in protective service occupations (5.24/1000 person-months), transportation (3.04/1000 person-months) and retail sales (2.29/1000 person-

months), while the lowest rates, were found among workers in education/teaching (1.11/1000 person-months) and health care occupations (1.45/1000 person-months) (Table 4). Compared to young workers in retail sales, those employed in health care and social assistance had a 48% lower rate of WPV victimization (IDR = 0.52). The rate of WPV victimization experienced by workers in protective service or law enforcement occupations was significantly higher than the WPV victimization rate among young workers in retail sales occupations (IDR = 2.25). However, the rate among workers in transportation was similar to the rate among workers in retail sales (IDR = 1.20).

Young workers 16 to 19 years had an 18% lower adjusted rate of WPV victimization than young workers 20 to 24 years (IDR = 0.82) (Table 4). Blacks had a 54% lower rate of WPV victimization compared to whites (IDR = 0.46). Young workers with household

TABLE 2 Unweighted and weighted proportions and average annual numbers of incidents of workplace violence victimization experienced by young workers between ages 16 and 24 years, United States National Crime Victimization Survey, 2008-2012

| | 5-y unweighted N (%) | Percent (95% CI) ^a | Weighted average annual number (95% CI) |
|--------------------------------|----------------------|-------------------------------|---|
| <i>Incident^a</i> | | | |
| <i>Time of Incident</i> | | | |
| Day | 182 (63.4) | 64.6 (57.6-70.6) | 126 086 (101 837-150 335) |
| Night | 105 (36.6) | 35.7 (29.4-42.4) | 69 883 (53 502-86 265) |
| <i>Type of Violence</i> | | | |
| Attempt/sexual attack/rape | 5 (1.7) | 1.7 (0.7-4.5) | 3564 (50-7179) |
| Attempt/completed robbery | 3 (1.0) | 1.3 (0.4-4.2) | 2683 (499-5866) |
| Physical attack/attempt | 53 (17.8) | 23.3 (17.4-30.6) | 47 602 (31 000-64 205) |
| Threat/verbal attack | 50 (16.8) | 20.4 (14.6-28.9) | 41 658 (25 631-57 686) |
| Personal theft | 187 (62.8) | 53.2 (45.3-60.9) | 108 430 (89 629-127 230) |
| <i>Police report</i> | | | |
| Yes | 82 (27.5) | 28.9 (23.7-34.7) | 58 828 (45 184-72 472) |
| No | 206 (69.1) | 67.5 (61.6-72.8) | 137 571 (112 542-162 600) |
| Unknown | 10 (3.4) | 3.6 (1.9-7.1) | 7540 (2320-12 760) |
| <i>Weapon^b</i> | | | |
| Yes | 20 (14.5) | 14.7 (9.5-22.3) | 16 422 (8197-24 646) |
| No | 107 (77.5) | 78.9 (71.0-85.2) | 87 925 (65 003-110 848) |
| Unknown | 11 (7.9) | 6.3 (3.2-12.0) | 7046 (2324-11 767) |
| <i>Weapon type^c</i> | | | |
| Handgun/other gun | 7 (35.0) | 37.0 (16.8-63.1) | 6085 (1382-10 788) |
| Knife | 4 (20.0) | 19.5 (6.6-45.3) | 3213 (0-6492) |
| Other | 8 (40.0) | 39.0 (17.4-65.9) | 6411 (224-12 598) |
| Unknown | 1 (5.0) | 4.5 (0.6-26.9) | 748 (0-2227) |
| <i>Perpetrator^d</i> | | | |
| Nonrelative ^e | 5 (4.5) | 4.4 (1.8-10.4) | 4161 (336-7985) |
| Customer/Patient | 7 (6.3) | 7.3 (3.5-14.7) | 6848 (1476-12 219) |
| Supervisor | 5 (4.5) | 3.6 (1.2-10.6) | 3411 (501-7322) |
| Employee | 3 (2.7) | 1.7 (0.5-5.2) | 1612 (247-3472) |
| Coworker | 31 (27.9) | 27.1 (18.5-37.8) | 25 522 (14 448-36 596) |
| Boyfriend/girlfriend | 3 (2.7) | 2.8 (1.2-6.3) | 2628 (484-4773) |
| Stranger | 57 (51.4) | 53.1 (42.6-63.3) | 5000 (32 969-67 029) |

^aExcludes incidents with unknown/missing time of day.

^bCollected only from victims who reported being present during the incident (n = 138).

^cCollected only from victims who reported that offender had a weapon (n = 20).

^dCollected only from victims who reported seeing/knowing the offender (n = 111).

^eNonrelative includes a friend, neighbor, or a schoolmate.

incomes from \$25 000 to \$39 999 had a 56% lower rate of WPV victimization than young workers in the less than \$25 000 category (IDR = 0.44). Youth who worked in suburban (IDR = 0.80) or rural (IDR = 0.67) areas had a significantly lower rate of WPV victimization than youth working in urban settings.

4 | DISCUSSION

This is the first study to estimate a rate of WPV victimization in youth under age 25 years using a national US-based sample. The

annual average rate of WPV victimization was 1.11 incidents per 1000 employed person-months among young workers from 2008 to 2012. Harrell²⁰ estimated a rate of four violent crimes per 1000 workers, 16 years or older, from 2002 to 2009 using NCVS data and concluded that the rate of nonfatal WPV declined by 35% during that time period.

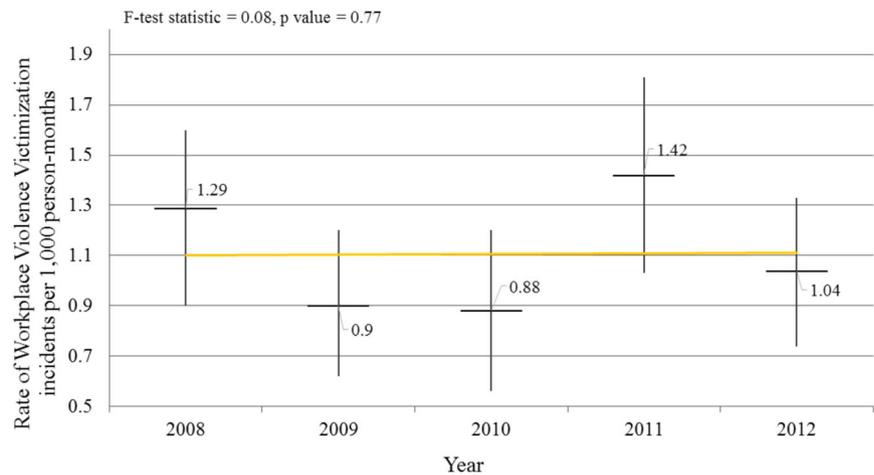
Workers in protective services or law enforcement, transportation, and in retail and sales occupations had the highest rates of WPV. However, young workers in protective services/law enforcement had significantly higher rates of WPV victimization than young workers in the retail sales occupations, which is consistent with prior

TABLE 3 Unweighted and weighted proportions and average annual numbers of victims who experienced workplace violence victimization between ages 16 and 24 years, United States National Crime Victimization Survey, 2008-2012 (N = 1 019 691)

| | 5-y unweighted N (%) | Percent (95% CI) ^a | Weighted average annual number (95% CI) |
|--|----------------------|-------------------------------|---|
| <i>Victim</i> | | | |
| <i>Industry^b</i> | | | |
| Agriculture, forestry, fishing, and mining | 2 (0.6) | 0.76 (0.18-3.1) | 1552 (0-3770) |
| Construction | 18 (6.0) | 5.3 (3.4-8.4) | 10 858 (5673-16 042) |
| Manufacturing | 16 (5.4) | 5.5 (2.7-11.0) | 11 295 (2987-19 603) |
| Transportation, communications, and public utilities | 11 (3.7) | 2.9 (1.6-5.5) | 6011 (2089-9932) |
| Wholesale trade | 4 (1.3) | 1.2 (0.32-4.0) | 2347 (0-5301) |
| Retail trade | 66 (22.2) | 23.2 (18.4-28.8) | 47 319 (34 815-59 823) |
| Finance, insurance, and real estate | 5 (1.7) | 1.9 (0.76-4.7) | 3882 (316-7449) |
| Business and repair services | 4 (1.3) | 1.8 (0.53-5.9) | 3659 (0-8229) |
| Personal services | 5 (1.7) | 1.8 (0.59-4.4) | 3601 (153-7049) |
| Entertainment and recreation | 94 (31.5) | 28.4 (22.7-35.0) | 57 950 (42 841-73 059) |
| Professional services | 66 (22.2) | 23.5 (17.9-30.2) | 47 894 (33 271-62 517) |
| Public administration/government | 7 (2.4) | 3.7 (1.1-11.5) | 7569 (0-16 552) |
| <i>Occupation^c</i> | | | |
| Sales and related | 70 (23.5) | 23.9 (19.3-29.2) | 48 721 (36 590-60 851) |
| Food preparation and serving related | 69 (23.2) | 21.1 (15.8-27.6) | 43 015 (28 944-57 087) |
| Skilled labor | 18 (6.0) | 5.6 (3.7-8.4) | 11 354 (6511-16 197) |
| Health care and social service | 20 (6.7) | 7.8 (4.4-13.5) | 15 981 (6693-25 269) |
| Education | 10 (3.4) | 3.6 (1.6-7.9) | 7271 (1246-13,296) |
| Protective services | 13 (4.4) | 5.1 (2.2-11.3) | 10 393 (1742-19 043) |
| Building and grounds cleaning and maintenance | 6 (2.0) | 3.1 (1.2-7.6) | 6298 (421-12 175) |
| Personal care and service | 10 (3.4) | 3.3 (1.8-6.2) | 6824 (2267-11 382) |
| Transportation and material moving | 20 (6.7) | 6.1 (3.4-10.5) | 12 351 (5102-19 601) |
| Office and administrative support | 23 (7.7) | 7.8 (4.6-12.9) | 15 898 (7386-24 409) |
| Construction | 14 (4.7) | 4.0 (2.2-7.2) | 8254 (3514-12 995) |
| Other | 25 (8.4) | 8.6 (5.5-13.2) | 17 578 (9017-26 138) |
| <i>Usually work</i> | | | |
| Days | 129 (43.3) | 43.4 (36.1-51.0) | 88 548 (68 766-108 328) |
| Nights | 79 (26.5) | 27.3 (21.3-34.3) | 55 721 (39 309-72 134) |
| Both, rotate shifts | 81 (27.2) | 26.4 (21.3-32.2) | 53 903 (39 884-67 923) |
| Unknown | 9 (3.0) | 2.8 (1.4-5.8) | 5767 (1467-10 068) |
| <i>Injury^d</i> | | | |
| No | 18 (66.7) | 70.0 (50.6-84.2) | 16 972 (8338-25 606) |
| Yes | 9 (33.3) | 30.0 (15.8-49.4) | 7258 (1950-12 565) |
| <i>Symptoms^e</i> | | | |
| Psychological only | 20 (66.7) | 66.7 (45.6-82.7) | 15,281 (8,277-22,285) |
| Physical only | 0 | 0 | 0 |
| Both psychological and physical | 10 (33.3) | 33.3 (17.3-54.4) | 7627 (2171-13 082) |

^a95% confidence intervals.^bIndustry collected using the crime incident report form represents the industry at the time of the event.^cOccupation collected using the crime incident report form which represents occupation at the time of the event.^dCollected only from victims who reported being hit or attacked.^eCollected only from victims who experienced physical attacks, verbal threats, sexual assault or rape and robbery and found the event moderately or severely distressing.

FIGURE 1 The rate of workplace violence victimization incidents per 1000 person-months among employed youth over the 5-year period, National Crime Victimization Survey, 2008 to 2012 [Color figure can be viewed at wileyonlinelibrary.com]



research.²⁰ In both occupations, frequent contact with the general public is common, but workers in protective service occupations are responsible for diffusing aggressive disputes that often involve volatile individuals.^{21,22} Prior research suggests that young workers in protective service occupations receive some training on how to de-escalate violent incidents using verbal communication and self-defense techniques before reporting on the job.²³ By the end of the training, they should be better-equipped at applying these elements during high-risk situations. However, to our knowledge, few studies have evaluated these programs for effectiveness, particularly for young workers, indicating a need for more research in this area.

In the retail and sales occupations, in addition to frequent contact with the general public, cash handling, and working late hours are common,^{9,10} particularly among teens: 32% to 82% youth working in retail and service industries reported that they worked past 7PM on a school night and up to 34% reported working after 10PM.²⁴⁻²⁶ Furthermore, employees working late evening hours or in businesses opened for 24 hours had up to three times the odds of experiencing a homicide.¹¹ Studies have found that less than 50% of youth employed in the retail industry received training to identify or de-escalate violent episodes or altercations with customers or coworkers.^{24,26} Hence, many adolescents work in retail and are at risk of experiencing WPV victimization but have little to no formal training. Safety training is a potential area to focus on future youth workforce intervention efforts.

Young workers in transportation occupations had an elevated rate of WPV victimization. An older study of 1992-96 NCVS data also reported transportation among the top five occupations with high incidence of workplace violence in the United States.²⁷ Transportation occupations encompass a wide range of jobs that involve the transport of passengers or goods and include those who work for trucking companies, public transit systems, airlines, taxi companies, or railroads.²⁸ Like workers in retail and sales, some workers in transportation have high exposure to the public especially those working for public transport; this may explain a potential risk of "service-related" violence from customers or clients of these businesses.²⁹ Efforts to create safer environments through enhanced security, closed ticket counters, restricted work hours, and technical

solutions (eg, computerized ticket dispensers), for example, are increasingly being utilized in public transportation.²⁹ However, a tailored approach that includes education, awareness, and threat management and response to violent incidents are needed.

Young workers in health care and education occupations had lower rates of WPV victimization compared to those in retail sales occupations. These findings are not supported by prior literature, most of which have included adult workers. Studies of workers over 25 years over the last decade indicate that the rate of violence and aggression in health care and education occupations has been equivalent to or higher than rates in the retail industry.^{20,30-34} Workers in health care occupations interact with patients who may be substance users or have mental health conditions³⁵ while workers in teaching occupations may be supervising students with emotional or behavioral disorders.³⁶ In light of this, nurses and special education teachers experience aggression and violence at double the rate of other occupations within their respective industry.^{30,33,34} However, in both health care and education occupations, young workers may be employed in positions with less patient or student contact and thus place them at lower risk of experiencing violence. More research is needed to understand what contextual factors place young workers in health care and education occupations at low risk for WPV victimization.

There were significant differences in the rate of WPV victimization by demographic characteristics. Young workers of 16 to 19 years of age had a lower rate of WPV victimization compared to young workers of ages 20 to 24 years. This may be related to the length of time spent at the workplace. Young workers (20 to 24 years) are more likely to be full-time workers and thus have more exposure. Blacks had a significantly lower rate of WPV victimization than whites. This contradicts reports that minorities and businesses with African American employees are more likely to experience an occupational fatality.^{10,12} Although numerous studies have reported that African American youth are more likely to be the target of victimization in the home and school settings,³⁷ this risk may not transfer to the workplace. Understanding the kinds of workplaces where African American young workers are employed is an imperative step for future studies. It would be interesting to

TABLE 4 Crude and adjusted incidence density ratios (IDRs) for the count of workplace violence victimization incidents among employed youth using multilevel, weighted Poisson regression models

| | Workplace violence victimization incidents | | |
|------------------------------------|--|----------------------------|----------------------------|
| | Rate per 1000 months | cIDR (95% CI) ^a | aIDR (95% CI) ^b |
| <i>Youth characteristics</i> | | | |
| Gender | | | |
| Male | 1.10 (0.89-1.31) | Ref | Ref |
| Female | 1.12 (0.92-1.33) | 1.08 (1.03-1.12) | 0.96 (0.75-1.23) |
| Age, y | | | |
| 16-19 | 0.96 (0.73-1.20) | 0.84 (0.80-0.88) | 0.82 (0.76-0.88) |
| 20-24 | 1.17 (0.97-1.37) | Ref | Ref |
| Race | | | |
| White | 1.16 (0.96-1.36) | Ref | Ref |
| Black | 0.56 (0.26-0.86) | 0.48 (0.48-0.49) | 0.46 (0.43-0.48) |
| Hispanic | 1.19 (0.84-1.55) | 0.98 (0.60-1.65) | 0.95 (0.71-1.28) |
| Asian | 1.23 (0.33-2.14) | 0.91 (0.47-1.77) | 0.70 (0.29-1.67) |
| American Indian/Alaskan Native | 1.94 (0.41-4.28) | 2.02 (0.07-61.04) | 2.50 (0.09-70.12) |
| Hawaiian/Pacific Islander | 1.72 (1.70-5.15) | 1.65 (0.21-12.89) | 1.65 (0.26-10.49) |
| Mixed | 1.11 (0.09-2.13) | 1.00 (0.60-1.65) | 0.97 (0.64-1.46) |
| Household income, \$ | | | |
| <25 000 | 1.11 (0.89-1.34) | Ref | Ref |
| 25 000-39 999 | 0.49 (0.29-0.69) | 0.43 (0.24-0.78) | 0.44 (0.24-0.81) |
| 40 000-74 999 | 1.39 (0.99-1.79) | 1.15 (0.89-1.48) | 1.10 (0.73-1.64) |
| 75 000 and over | 1.26 (0.91-1.61) | 1.10 (0.72-1.70) | 1.10 (0.76-1.59) |
| Work Characteristics | | | |
| Occupation^c | | | |
| Health care and social assistance | 1.45 (0.69-2.21) | 0.52 (0.27-1.01) | 0.52 (0.26-1.03) |
| Education/teaching | 1.11 (0.22-2.00) | 0.41 (0.07-2.53) | 0.39 (0.06-2.77) |
| Protective service/law enforcement | 5.24 (1.65-8.83) | 2.29 (1.48-3.54) | 2.25 (1.34-3.77) |
| Retail sales | 2.29 (1.76-2.82) | Ref | Ref |
| Transportation | 3.04 (0.92-5.15) | 1.19 (0.76-1.86) | 1.20 (0.63-2.30) |
| Other | 0.57 (0.44-0.70) | 0.23 (0.22-0.24) | 0.22 (0.21-0.24) |
| Work location | | | |
| Urban | 1.13 (0.95-1.32) | Ref | Ref |
| Suburban | 1.02 (0.67-1.38) | 0.85 (0.84-0.86) | 0.80 (0.78-0.81) |
| Rural | 0.70 (0.32-1.09) | 0.62 (0.48-0.78) | 0.67 (0.48-0.94) |
| Combination | 0.84 (0.48-1.19) | 0.67 (0.37-1.19) | 0.75 (0.46-1.23) |

^aCrude-incidence rate ratios (cIDR) and 95% confidence intervals.

^bAdjusted incidence rate ratios (aIDR) and 95% confidence intervals and model controlled for all covariates.

^cOccupation collected using the basic screen questionnaire form.

determine if workplaces are located in concentrated minority community settings that might protect their youth. Such has been seen in Latino communities, where strong social ties and resources may buffer against violence.³⁸

These studies will require ample sample sizes and thus statistical power to explore reasons for the racial differences in the rate of WPV victimization.

Personal theft was the most common form of WPV victimization. However, prior studies of WPV in young workers have excluded

personal theft; in those studies, verbal and sexual assaults were most frequently reported.^{7,8} The large proportion of personal theft may explain the low proportion of cases reported to the police. Personal theft frequently involves inexpensive property³⁹; due to this minor loss without threat, victims may not have viewed these incidents as serious and be less inclined to file a report with law enforcement.⁴⁰ Since these incidents are occurring at the workplace, there is also the possibility that youth are reporting these incidents to management instead of law enforcement.

4.1 | Limitations

WPV is usually defined as physical or verbal assaults directed at a person while at work or on duty but occasionally may include any events that occur at the worksite that invoke feelings of discomfort among workers.⁴¹ For the purposes of this study, incidents of personal theft that occurred at the worksite were included in our definition of workplace violence to conduct a comprehensive study of all types of violence and victimization. Because of this inclusion, we defined our outcome of interest as WPV victimization which differs from prior studies.

We were restricted to the variables that were available in the NCVS data set and may not have adequately controlled for all potential confounders. For instance, part- or full-time status or usual time of work were not available for analysis. Furthermore, we were limited to the categories provided for occupation on the survey, which grouped the food preparation and service-related occupations into the "other" category. This was a major limitation since a large proportion of youth is employed within these occupations. Participants were asked to recall events of victimization over the last 6 months. Recall bias may occur resulting in underreporting or misclassification, which is likely toward the null and may lead to an underestimate of differences in rates.

Person-time was calculated based on the number of time points youth reported being employed. This survey provided only a proxy for continuous employment and each time point was taken as equivalent to 6 months. Capturing workplace incidents was not the primary goal of NCVS, which may have led to the differences in the types of violent incidents reported compared to prior research.

Finally, we included a wide age range, from 16 to 24 years of age, to represent young workers which has some heterogeneity. We did control for the age group (16-19 and 20-24 years) in our multi-variable models. However, future studies may benefit from a separate examination of these age groups.

5 | IMPLICATIONS AND CONTRIBUTION

This is the first study to compare the rate of WPV victimization by occupation and demographic characteristics and describe incidents of WPV victimization in a nationally representative sample of young workers. Young adults, who will continuously enter the workforce, represent some of the most vulnerable workers due to their lack of experience, knowledge, and training. Several areas of research are indicated by our findings. First, future studies focused on racial/ethnic groups are warranted, as we discovered risk patterns to be strikingly different from the general literature on violence. In addition, continued intervention research on retail and protective service occupations is recommended, since youth in these occupations experience the highest rates of WPV victimization. Future studies should be designed to investigate unique contextual and worker factors at play in these high-risk occupations.

Fortunately, attention is growing in the area of workplace violence prevention for young workers but a strong evidence base

has yet to be established. New studies focused on young workers are needed. Furthermore, as we continue to learn more about effective strategies for intervention in adult populations (where most of the research is focused), future translation studies can also tailor interventions to specific settings and characteristics of young workers at high risk of WPV.

CONFLICT OF INTERESTS

The authors declare that there are no conflicts of interest.

DISCLOSURE BY AJIM EDITOR OF RECORD

Rodney Ehrlich declares that he has no conflict of interest in the review and publication decision regarding this article.

AUTHOR CONTRIBUTIONS

MT conceived the study; MT, MR, CC, and CPA designed the work; MT acquired and analyzed the data for the work; MT and MR drafted the work; MT, MR, CPA, AS, and CC interpreted the data and revised the manuscript critically for important intellectual content, provided final approval of the version to be published, and agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

INSTITUTION AND ETHICS APPROVAL

This work was performed at the University of Iowa. Because this study used secondary data, it was determined to be not human subjects research by the University of Iowa.

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