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RESEARCH ARTICLE

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Prescription opioid use and associated factors among US construction workers

Xiuwen S. Dong DrPH | **Raina D. Brooks MPH** | **Chris T. Cain CIH**

CPWR—The Center for Construction Research and Training, Silver Spring, Maryland

Correspondence
Xiuwen S. Dong, DrPH, CPWR—The Center for Construction Research and Training, 8484 Georgia Avenue, Silver Spring, MD 20910.
Email: sdong@cpwr.com

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Abstract

Background: Construction workers are among the segments of the US population that were hit hardest by the opioid prescription and overdose deaths in the past decades. Factors that underlie opioid use in construction workers have been compartmentalized and isolated in existing studies of opioid use and opioid overdose, but they ignore the overall context of their use. This study examines prescription opioid use and its association with a variety of occupational and nonoccupational factors in construction workers in the United States.

Methods: Data from the 2011-2017 Medical Expenditure Panel Survey (n = 7994) were analyzed. The prevalence of prescribed opioid use and the association with occupational and nonoccupational characteristics among construction workers were examined in four multiple logistic regression models.

Results: The odds of prescription opioid use for workers with occupational injuries was more than triple that of their noninjured counterparts when demographics and occupational factors were controlled (odds ratio = 3.38, 95% confidence interval: 2.38-4.81). Odds of prescription opioid use were higher in older construction workers, workers who were white, non-Hispanic, working part-time, and in poorer health, while Hispanic workers and those without health insurance were much less likely to report prescription opioid use.

Conclusions: Prescription opioid use among construction workers encompasses both occupational and nonoccupational factors. As an insight into opioid use among construction workers becomes clearer, effectively responding to the opioid crisis remains a challenge.

KEYWORDS
Hispanic workers, older workers, prescription opioids, uninsured, work-related injury

1 | INTRODUCTION

Opioid use, addiction, and overdose have been an epidemic and rapidly growing problem in the United States, causing untold disability, loss of functions, and even lives.[1-10] Between 1999 and 2017, the age-adjusted death rate for unintentional drug overdose increased nearly fivefold from 4.0 to 19.1 per 100 000 standard population, with over 70 000 deaths occurring in 2017 alone.[8,11] Moreover, the opioid epidemic has been a burden financially to both individuals and society. In 2018, the opioid crisis cost the United States $696 billion, totaling $2.5 trillion since 2015.[12]

The harms from rising opioid use have affected millions of working Americans. A recent study using nationally representative survey data found that about 12.6% of US workers used prescription opioids, accounting for $2.81 billion in medical expenses annually.[13] According to data from the US Bureau of Labor Statistics (BLS), unintentional overdose fatalities in the US workplace increased more than four times between 2011 and 2018.[14] Studies also found that construction workers were more likely to use opioids and die of opioid-related overdoses than workers in other industries.[15-20] Furthermore, workplace overdose fatalities in the construction industry increased ninefold from 2011 to 2018, double the increase in all industries combined during the same period.[21]

In response to this opioid crisis in the workplace, a great number of studies have been done through various approaches.[6,13,17,21-29] For studies examining opioid use among workers, most of them consisted of workers' compensation (WC) claimants at the state level.[22,25,28] On the other hand, a couple of studies using national survey and employer-sponsored health care data analyzed opioid use among US workers.[13,26] However, these studies failed to consider work-related injury, the important contributor to opioid use identified by the aforementioned research from WC data.

The effects of opioid use and misuse are not isolated to work or home environments.[30] Given that workers are commonly prescribed opioid pain relievers, a better understanding of utilization patterns and characteristics of prescription opioid users would provide important information for workers, employers, health care providers, occupational safety and health professionals, and policymakers, as all confront the growing number of opioid-related problems. More specifically, previous studies have found construction workers with injuries were more likely to receive prescription opioids.[20,21] For this reason, it is necessary to further examine how factors, such as injury, demographics, employment characteristics, health status, and insurance coverage confound and/or compound opioid use among this high-risk worker group.

2 | METHODS

2.1 | Data source

This study analyzed 2011-2017 Medical Expenditure Panel Survey (MEPS) data. MEPS is a set of large national surveys collecting information on health, health care cost, and utilization among noninstitutionalized Americans. Every year, survey participants are assigned to a panel and followed for five rounds of interviews in two calendar years. MEPS has three major components: household, medical condition, and insurance. MEPS is cosponsored by the Agency for Healthcare Research and Quality (AHRQ) and the National Center for Health Statistics (NCHS). Related information regarding MEPS is available at http://www.meps.ahrq.gov/. In this study, three household component data files were linked by individual survey identifiers for analysis: (a) full year consolidated (composed of three rounds of survey data covering the full calendar year) containing demographic and employment information, (b) medical conditions providing injury information, and (c) prescribed medications containing information on prescription opioid use. As this study used only publicly accessible data, it was exempt from institutional board review by the Institutional Review Board of CPWR-The Center for Construction Research and Training.

2.2 | Terms and definitions

The *construction industry* was coded as “3” in the MEPS industry codes, corresponding to the code “23” in the North American Industry Classification System.[31] *Construction workers* were defined as respondents who were 16 years or older and self-reported that they were employed in the construction industry during at least one of the three survey rounds in the year regardless of their occupation.

Opioids in this study refer to only outpatient prescription fills of opioids including narcotic analgesics and narcotic analgesic combinations. *Prescription opioid user* was a respondent who had one or more prescription opioid fills in any survey round during the year. *Persistent prescription opioid user* was a respondent who had a prescription opioid fill more than once during the year. *Non-opioid analgesics* purchased by respondents include nonsteroidal anti-inflammatory agents, salicylates, topical nonsteroidal anti-inflammatories, miscellaneous analgesics skeletal muscle relaxants, topical anesthetics, and analgesic combinations.

Work-related injury was identified based on two questions that the respondent was asked when he or she reported a medical condition: (a) whether the condition was due to an accident or injury, and (b) whether the accident or injury occurred at work. If the answers were “Yes” to both questions, a work-related injury was counted.

Race/ethnicity was based on information reported for each family member in the survey. For this study, the following classifications by race and ethnicity were used: Hispanic, non-Hispanic white, non-Hispanic black, and non-Hispanic other. The other category includes American Indian, Alaska Native, Asian or Pacific Islander, other race, and multiple races.

Family poverty status was categorized according to the total annual household income of the respondent: (a) poor: household income below the federal poverty line; (b) low income: household income over the poverty line through 200% of the poverty line; (c) middle income: household income over 200% to 400% of the poverty line; (d) high income: over 400% of the poverty line.

Health insurance coverage refers to any insurance including both private (such as employment-based or self-purchased) and public (eg, Medicare, Medicaid) insurance. The uninsured were defined as workers who were not covered by any type of insurance.

Perceived health status was self-rated by the respondent at the time of the interview according to the following categories: excellent, very good, good, fair, and poor. This study included both general physical and mental health in the analysis, in which excellent and very good were grouped, while fair and poor were combined to obtain a clearer pattern.

Census region was based on the location of the household at the end of the year, including four regions (ie, West, Midwest, Northeast, and South) defined by the US Census Bureau. Detailed information on region division is available at https://www.census.gov/prod/1/gen/95statab/preface.pdf

2.3 | Statistical analyses

Prescribed opioid use was stratified by demographic characteristics (i.e., age group, sex, race/ethnicity, education, region, income), employment characteristics (i.e., average hours worked per week, establishment size, occupation), health status (i.e., physical and mental), insurance coverage, and work-related injury. Overall persistent prescription opioid use was stratified by a work-related injury. χ^2 tests were used to test whether differences in prescription opioid use among subgroups were statistically significant. Multivariable logistic regression models were constructed to identify factors that could be associated with prescription opioid use after adjusting for control variables. Four models were developed with each adding more variables to the previous one: Model 1 included demographic characteristics only, Model 2 added employment characteristics, Model 3 added work-related injury, and Model 4 added insurance coverage and general health status. Adjusted odds ratios (aOR) and 95% confidence intervals (CI) were tabulated from the multivariable logistic regression models. All statistical tests (including the χ^2 tests) were two-sided and $P < .05$ were considered statistically significant. MEPS data from 2011 to 2017 were pooled to improve data reliability. The average weighted value was calculated by combining all 7 years and dividing by 7. All statistical analyses were performed using SAS 9.4 (SAS Institute, Cary, NC). To account for the weighted MEPS sample, SAS SURVEY procedures and survey weights, strata, and clustering were used in all statistical analyses.

3 | RESULTS

From 2011 to 2017, 7994 MEPS respondents reported that they were employed in the construction industry, representing about 11.3 million (n = 11 281 000) workers in this industry annually (Table 1). Among these construction workers, about 10.4% used prescription opioids during the study period. Prescription opioid use was significantly higher among older workers (≥45 years) than younger workers (<35 years; $P < .01$). Though women only made up 9% of the construction workforce, prescription opioid use was significantly higher among women than men (15.3% vs 10.0%; $P < .01$). Prescription opioid use was also significantly higher among white, non-Hispanic construction workers than Hispanic workers (12.5% vs 5.6%; $P < .01$). Regarding geographic region, prescription opioid use was highest among construction workers in the Midwest (12.5%; $P < .05$).

Prescription opioid use by occupational characteristics, health status, insurance coverage, and work-related injury is presented in Table 2. Regarding occupational characteristics, prescription opioid use was more prevalent among workers who worked less than 35 hours per week than their full-time counterparts (13.5% vs 9.1%; $P < .01$). By occupation, workers in administrative support/sales and service occupations were more likely to use prescription opioids than those in production occupations (15.7% vs 9.6%; $P < .05$). Moreover, workers suffering from work-related injuries had a significantly higher prevalence of prescription opioid use than those who were not injured (25.3% vs 8.9%; $P < .01$). In terms of health insurance coverage, prescription opioid use was lower among uninsured workers than insured workers (6.5% vs 12.1%; $P < .01$). In addition, prescription opioid use was highest among workers who reported poorer physical and mental health status, 17.3% and 20.7%, respectively ($P < .01$). Regarding persistent use, about 3% of construction workers were persistent prescription opioid users (2.8%; Figure 1). However, workers who suffered a work-related injury were nearly four times as likely to be persistent prescription opioid users as those who were not injured (8.4% vs 2.2%; $P < .01$).

Table 3 presents the results of four multiple logistic regression models. Model 1 suggests that age, gender, and race/ethnicity were associated with prescription opioid use after controlling for educational level, region, and income. After taking occupational characteristics into consideration, gender was no longer significant in Model 2; however, working less than 35 hours per week was associated with higher odds of opioid use compared with working 40 hours per week (OR = 1.43, 95% CI: 1.07-1.90). Administrative/sales/services occupations were also associated with higher odds of opioid use compared with managerial/professional (OR = 1.85; 95% CI: 1.18-2.89). Model 3 included work-related injury in the tabulation and found that this factor was one of the major contributors to prescription opioid use. Prescription opioid use among workers suffering work-related injuries tripled the use among their counterparts without such injuries (OR = 3.38, 95% CI: 2.38-4.81) after controlling for demographic and other employment factors.

When health status and insurance coverage were taken into consideration (Model 4), both physical health and mental health were found significantly associated with prescription opioid use when other factors remained constant. Construction workers in poorer physical or mental health were two to three times more likely than those in excellent/very good health to use prescription opioids (OR = 2.60, 95% CI: 1.74-3.88; OR = 2.03, 95% CI: 1.26-3.29, respectively). On the other hand, uninsured construction workers had significantly lower odds of using prescription opioids than those with insurance (OR = 0.60, 95% CI: 0.41-0.89). Work-related injury remained a significant factor for prescription opioid use. Injured workers were 3.2 times as likely to use prescription opioids than noninjured workers (OR = 3.16, 95% CI: 2.19-4.56) after controlling for other potential confounders. Other factors, such as race/ethnicity, hours worked per week, and occupation were still significant. Hispanic workers were nearly half as likely to use prescription opioids as their white, non-Hispanic counterparts (OR = 0.52, 95% CI: 0.39-0.70). Those who worked less than 35 hours per week were 50% more likely to use prescription opioids than those who worked 35 to 40 hours per week (OR = 1.50, 95% CI: 1.12-2.01). Prescription opioid use was 70% higher in administrative support/sales and service occupations than management and professional occupations (OR = 1.68, 95% CI: 1.06-2.65).

4 | DISCUSSION

This study examined prescribed opioid use among US construction workers and explored multiple occupational and nonoccupational

TABLE 1 Demographics and prevalence of prescription opioid use among construction workers, 2011-2017 (average)

Characteristic	Distribution, %	Opioid use prevalence, %	95% CI	P value*
Total construction	100.0	10.4	9.42-11.5	...
Age group				**.0004**
16-24 y	11.8	8.7	6.3-11.1	
25-34 y	24.1	7.6	6.1-9.1	
35-44 y	22.9	10.0	7.9-12.1	
45-54 y	22.1	12.0	9.5-14.4	
55+ y	19.0	13.9	11.2-16.7	
Sex				**.0074**
Male	91.0	10.0	8.9-11.0	
Female	9.0	15.3	11.8-18.8	
Race/ethnicity				**<.0001**
Hispanic	26.0	5.6	4.6-6.6	
White, non-Hispanic	64.4	12.5	11.1-14.0	
Black, non-Hispanic	5.3	9.3	6.7-11.9	
Other, non-Hispanic	4.3	10.0	5.8-14.2	
Education				.3588
No college	59.9	10.1	8.9-11.4	
College	40.1	11.0	9.4-12.6	
Region				**.0368**
Northeast	15.6	9.2	5.8-12.6	
Midwest	20.3	12.5	10.3-14.8	
South	41.7	10.8	9.2-12.4	
West	22.4	8.8	7.4-10.3	
Family poverty status				.2486
Poor to low (<200%)	26.5	10.0	8.5-11.6	
Middle (200% to <400%)	34.1	9.4	7.9-10.9	
High (≥400%)	39.3	11.6	9.7-13.5	
Weighted frequency	*n* = 11 281 000	*n* = 1 177 000		

*Wald χ^2 test. Significant *P* values ($P < .05$) are indicated in bold.

factors that may underlie prescribed opioid use using data from a large national survey, the Medical Expenditure Panel Survey. The results show that on average, about 10.4% of construction workers used prescription opioids during 2011-2017. The multiple regression analyses reveal that work-related injuries had the strongest association with prescription opioid use among all the variables evaluated in this study. The odds of prescribed opioid use among injured construction workers more than tripled when compared with their noninjured counterparts, which was statistically significant after controlling for possible confounders. Moreover, persistent prescription opioid use was considerably higher among construction workers with work-related injuries than those without injuries. This study also found a significant socioeconomic and racial-ethnic disparities in prescription opioid use among construction workers.

The higher odds of prescribed opioid use among injured construction workers could be one of the major factors underlying the higher prevalence of opioid use and the higher rate of opioid-related overdose deaths in construction occupations that have been previously reported.[16,17,32] Construction is one of the industries with high risks of injury at worksites. The rates of work-related fatal and nonfatal injuries are consistently higher than most industry sectors and the overall workforce in the United States.[33] Moreover, injuries in construction may be severe. While the injury rate of total reported cases in the construction industry was about 7% higher than all private industries combined in 2018, the rate of cases with days away from work (or severe injuries) was 33% higher than the overall private industries on average.[34] It is not surprising that severe injuries lead to severe pain that may have to be treated by pain relievers. This may explain why construction workers were more likely to receive prescription opioids post-injury than workers in other industries.[20] Furthermore, studies suggest that injury and chronic pain could lead to poor physical and mental health[35-37]; and poor physical and mental health were associated with greater prescription opioid use, which was supported by this study and previous research.[38,39]

TABLE 2 Employment and health characteristics and prescription opioid use among construction workers, 2011-2017 (average)

Characteristic	Distribution, %	Opioid use prevalence, %	95% CI	*P* value*
Overall	100	10.4	9.42-11.5	…
Average hours worked per week				**.0036**
<35	16.9	13.5	11.3-15.8	
35-40	56.0	9.1	7.8-10.4	
>40	27.1	11.3	9.0-13.7	
Establishment size				.19
Self-employed	29.9	11.9	9.4-14.3	
1-9 employees	24.9	8.9	7.4-10.4	
10-19 employees	13.6	8.1	5.7-10.6	
20-49 employees	12.1	10.6	7.4-13.9	
50-99 employees	8.3	13.8	8.1-19.4	
100+ employees	11.2	11.4	7.8-14.9	
Occupation				**.04**
Management/professional	22.2	10.3	8.0-12.6	
Admin support/sales/service	8.5	15.7	12.0-19.3	
Construction trade	62.3	9.7	8.3-11.0	
Other production	7.0	9.6	5.5-13.6	
Work-related injury				**<.0001**
Yes	9.2	25.3	20.6-30.0	
No	90.8	8.9	7.9-10.0	
Health insurance coverage				**<.0001**
Insured	70.1	12.1	10.7-13.4	
Uninsured	29.9	6.5	5.0-8.0	
General physical health				**<.0001**
Excellent/very good	63.0	7.0	6.1-7.9	
Good	27.3	16.0	13.7-18.4	
Fair/poor	9.7	17.3	13.7-21.0	
Mental health				**<.0001**
Excellent/very good	73.9	9.1	8.0-10.2	
Good	22.3	13.2	10.7-15.6	
Fair/poor	3.8	20.7	14.7-26.7	
Weighted frequency	*n* = 11 281 000	*n* = 1 177 000		

* Wald χ^2 test. Significant *P* values ($P < .05$) are indicated in bold.

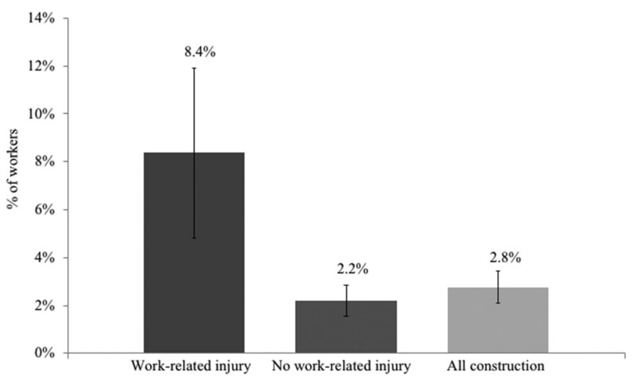

FIGURE 1 Persistent prescription opioid use among construction workers, by injury status*, average of 2011-2017. *Significant difference (*P* value <.01) between injury status

This study also found that construction workers who worked less than 35 hours per week were more likely to use prescription opioids than those who worked a typical full-time schedule (35-40 hours/week). Previous research found that injured construction workers would work fewer hours or with difficulty to maintain a full-time job due to the physical demands in this industry.[35,40,41] These injured workers with part-time status could be more likely to use prescription opioids for pain management. Fewer working hours among construction workers could also be due to the uncertain and precarious employment arrangements in this industry,[42,43] reflecting work organization changes in recent decades.[44] Workers with such arrangements typically have a disproportionately high risk for occupational injury, illness, and other adverse health outcomes.[45-47] Moreover, job insecurity is a generator of stress, which may lead to negative consequences for workers' mental health[48-50] such as

TABLE 3 Multivariable logistic regression of prescription opioid use among construction workers, 2011-2017 (average)

	Model 1 (n = 7832)		Model 2 (n = 6279)		Model 3 (n = 6279)		Model 4 (n = 6277)	
Characteristic	**OR**	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**
Age group								
16-24 y	Reference		Reference		Reference		Reference	
25-34 y	0.89	0.61-1.32	1.14	0.71-1.84	1.18	0.74-1.90	1.17	0.73-1.88
35-44 y	1.19	0.79-1.79	1.46	0.87-2.45	1.51	0.92-2.48	1.36	0.82-2.25
45-54 y	1.41	0.96-2.06	**1.75**	**1.08-2.84**	**1.75**	**1.09-2.82**	1.48	0.92-2.37
55+ y	**1.58**	**1.07-2.34**	**2.05**	**1.30-3.23**	**2.16**	**1.37-3.41**	**1.63**	**1.01-2.64**
Sex								
Male	Reference		Reference		Reference		Reference	
Female	**1.50**	**1.11-2.03**	1.16	0.79-1.73	1.26	0.85-1.89	1.29	0.85-1.97
Race/ethnicity								
White, non-Hispanic	Reference		Reference		Reference		Reference	
Hispanic	**0.44**	**0.34-0.57**	**0.48**	**0.36-0.64**	**0.50**	**0.38-0.67**	**0.52**	**0.39-0.70**
Black, non-Hispanic	**0.70**	**0.50-0.99**	0.68	0.46-1.00	0.70	0.47-1.04	0.73	0.48-1.10
Other, non-Hispanic	0.81	0.50-1.30	0.76	0.44-1.31	0.81	0.47-1.41	0.82	0.46-1.47
Education								
No college	1.06	0.86-1.31	1.04	0.82-1.31	1.01	0.80-1.28	1.03	0.81-1.30
College	Reference		Reference		Reference		Reference	
Region								
Northeast	0.90	0.56-1.45	1.02	0.61-1.71	1.12	0.66-1.89	1.10	0.66-1.84
Midwest	1.24	0.92-1.66	1.14	0.82-1.57	1.19	0.84-1.66	1.12	0.79-1.58
South	1.20	0.93-1.54	1.13	0.85-1.52	1.20	0.89-1.63	1.24	0.89-1.71
West	Reference		Reference		Reference		Reference	
Family poverty status								
Poor to low (<200%)	1.17	0.90-1.53	1.09	0.80-1.49	1.06	0.78-1.43	1.00	0.75-1.35
Middle (200% to <400%)	0.93	0.71-1.23	0.96	0.71-1.28	0.96	0.72-1.28	0.89	0.67-1.19
High (≥400%)	Reference		Reference		Reference		Reference	
Average hours worked per week								
35-40		···	Reference		Reference		Reference	
<35		···	**1.43**	**1.07-1.90**	**1.52**	**1.12-2.05**	**1.50**	**1.12-2.01**
>40		···	1.19	0.88-1.60	1.18	0.87-1.60	1.22	0.91-1.64
Establishment size								
Self-employed		···	0.90	0.58-1.41	0.86	0.54-1.36	0.96	0.60-1.54
1-9 employees		···	0.79	0.53-1.20	0.77	0.50-1.17	0.82	0.53-1.27
10-19 employees		···	0.69	0.42-1.13	0.68	0.42-1.12	0.77	0.47-1.26
20-49 employees		···	0.90	0.57-1.44	0.83	0.51-1.35	0.82	0.50-1.33
50-99 employees		···	1.22	0.67-2.22	1.17	0.65-2.09	1.16	0.64-2.09
100+ employees		···	Reference		Reference		Reference	
Occupation								
Management/professional		···	Reference		Reference		Reference	
Admin support/sales/service		···	**1.85**	**1.18-2.89**	**1.82**	**1.16-2.85**	**1.68**	**1.06-2.65**
Construction trade		···	1.32	0.99-1.76	1.24	0.92-1.68	1.22	0.91-1.65
Other production		···	1.03	0.58-1.83	0.95	0.54-1.70	0.89	0.50-1.58
Work-related Injury								
Yes		···		···	**3.38**	**2.38-4.81**	**3.16**	**2.19-4.56**
No		···		···	Reference		Reference	
Insurance coverage								
Insured		···		···		···	Reference	
Uninsured		···		···		···	**0.60**	**0.41-0.89**

(Continues)

TABLE 3 (Continued)

	Model 1 (n = 7832)		Model 2 (n = 6279)		Model 3 (n = 6279)		Model 4 (n = 6277)	
Characteristic	**OR**	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**
General physical health								
Excellent/very good		…		…		…	Reference	
Good		…		…		…	**2.84**	**2.14-3.75**
Fair/poor		…		…		…	**2.60**	**1.74-3.88**
Mental health								
Excellent/very good		…		…		…	Reference	
Good		…		…		…	0.95	0.69-1.32
Fair/poor		…		…		…	**2.03**	**1.26-3.29**

Significant odds ratios (*P* < .05) are indicated in bold.

depressive disorders[51] and anxiety,[52] as well as their general physical health[53] and heart disease.[54] In fact, workers with poorer physical or mental health were more likely to use prescription opioids as shown in this study and previous research.[26,36,55]

The higher odds of prescription opioid use among older construction workers (≥55 years) could be attributed to the higher prevalence of musculoskeletal disorders and chronic conditions among workers in this age group.[33,56,57] In addition to aging, job exposures in construction could worsen health conditions among workers whose long-term job was in construction.[58-60] Given the increasingly aging workforce trends in construction,[61] the higher opioid prescription rates among older construction workers is particularly worrisome since older workers are more likely to have an adverse event, possibly death, from taking opioid medications.[62]

This study also indicates that prescription opioid use among women construction workers was significantly higher than their male counterparts despite women accounting for a small proportion of the construction workforce. This result was consistent with previous research showing greater susceptibility in opioid use among women.[63] The US Centers for Disease Control and Prevention estimated that between 1999 and 2010, the percentage increase in deaths from prescription painkiller overdose was more than 400% among women compared with 265% in men.[64] The gender difference in opioid use may explain the higher rate of opioid use among workers in administrative support, sales, and service occupations identified in this study and previous research[13,25,32] since the so-called "pink-collar" occupations are typically female dominated.

The racial-ethnic disparities in prescription opioid use among construction workers reported in this study confirm previous research indicating that minorities are less likely to receive prescription opioids.[13,21,26,55] In addition to variations in age, insurance coverage, and other variables examined in this study, the effect of race/ethnicity in a physician's decision to prescribe opioids[65-67] may have contributed to lower prescribed opioid use among Hispanic construction workers.

This study found that work-related injury was strongly associated with prescription opioid use, while the highest prevalence of prescription opioid use was found among workers in administrative support/sales and service occupations. These findings are somewhat surprising since it is well-known that workers in construction trades have higher rates of work-related injury than other occupations.[33,68] Several underlying factors, including the gender and racial-ethnic disparities discussed above, might explain the seemingly contradictory results. Construction is a male-dominated industry. While about 9% of the construction workforce are women, the proportion of women workers in construction trades is less than 3%.[33] In addition, Hispanic workers account for less than 30% of the overall construction employment, but more than 90% of them are employed in construction trades and other production occupations.[33] On one hand, Hispanic workers have a disproportionally high risk of work-related injuries[69,70]; on the other hand, Hispanic workers are less likely to have health insurance coverage,[71] and have greater difficulty receiving workers' compensation if they are injured compared with their non-Hispanic counterparts.[72] Prior research found that workers are less likely to seek health care if they lack health insurance.[73] As a result, Hispanic workers in construction trades might be less likely to receive prescription opioids even if they were injured. Hispanic construction workers are much younger than non-Hispanic workers.[33] This study found a higher prevalence of opioid use among older construction workers; however, older workers are less likely to work in some high-risk construction trades, such as roofers.[33]

Furthermore, opioid use may be restricted in certain safety-sensitive occupations in construction trades, such as those involving motor vehicle operation, forklift driving, overhead crane operation, heavy equipment operation, and other tasks that require high levels of cognitive function and judgment.[74] Such special occupational requirements might partially explain why the occupational difference remains after controlling for demographics and several other factors.

In addition to the study findings presented, it is also prudent to disclose possible gaps and limitations. First, this study only examined outpatient prescription opioid use. Since most opioid overdose deaths involve nonprescription opioids,[8,16,19,21] and a higher prevalence of illicit opioid use among construction workers,[21,32] further studies on nonprescription opioid use and illicit drug use among construction workers is needed to better understand the overall opioid crisis in this industry. Although the study shows differences among major occupation categories, information on detailed construction occupations and job requirements is unavailable due to the data and sample size limitations. Despite the impact of condition severity on a physician's decision to prescribe opioids, this study is unable to account for variations in clinical presentations. Lastly, while the MEPS is a panel survey, the study findings are based on the data collected during the survey rounds in the calendar year instead of the entire 2-year follow-up period. Therefore, the causal relationships between the outcome (prescription opioid use) and contributing factors as well as the opioid effect pre- and post-injury, cannot be fully determined due to the cross-sectional design. Similarly, this analysis is unable to sort out whether poor mental health occurs before injury and before opioid use, or whether poor mental health is a consequence of an injury that required opioid use since the results only reflect the respondent's status at the time of the interview.

Despite the limitations, this study expanded and enhanced existing research by examining multiple occupational and nonoccupational factors and their associations with prescription opioid use. Since the workplace is an integral part of life for construction workers, integrating work- and nonwork-related factors, comprehensively examines opioid use among construction workers. This Total Worker Health (TWH) approach is strongly encouraged by the National Institute for Occupational Safety and Health.[75] In addition, the findings were based on 7 years of data pooled together from a large nationally representative sample with self-reported medical conditions and prescription information supplemented from healthcare providers. This method increased the validity and reliability of the study results. The findings from the national household survey also complement studies based on workers' compensation claims and the national death index,[17,76] thereby adding value to the growing body of literature evaluating the opioid crisis in the United States. Finally, the high prevalence of prescription opioid use among injured construction workers and older workers suggests that strategies to cope with the opioid crisis should include improving worker safety and health, reducing occupational injuries and illnesses, managing pain effectively, providing worker and employer education, ensuring effective treatment of substance use disorders, and supporting workers in recovery.

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CONFLICTS OF INTEREST

The authors declare that there are no conflicts of interest.

DISCLOSURE BY AJIM EDITOR OF RECORD

John D. Meyer declares that he has no conflict of interest in the review and publication decision regarding this article.

AUTHOR CONTRIBUTIONS

XSD: designed the study, acquired and analyzed the data, interpreted the results, drafted and revised the manuscript critically for important intellectual content, approved the final version before submission, and agreed to be accountable for all aspects of the work. RDB analyzed data, created tables and chart, interpreted results, and drafted manuscript. CTC participated in study design and approved the final version before submission, and agreed to be accountable for all aspects of the work.

ETHICS APPROVAL AND INFORMED CONSENT

As this study used only publicly accessible data, it was exempt from review by the CPWR Institutional Review Board.

DISCLAIMER

The findings and conclusions in this study are those of the authors and do not necessarily represent the views of the National Institute for Occupational Safety and Health.

ORCID

Xiuwen S. Dong http://orcid.org/0000-0002-6253-0598

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