

BRIEF REPORT

Opioid Medications Prescribing and the Pain-Depression Dyad in Primary Care: Analysis of 2014–2015 National Ambulatory Medical Care Survey (NAMCS) Data

Susan X. Lin, DrPH, Khusbu Patel, PharmD, and Richard G. Younge, MD, MPH

Background: Increased drug overdose deaths have become a serious public health problem. Primary care providers prescribe about 50% all opioid medications. This study examined opioids prescribing during primary visits to patients with a pain-depression dyad and patient demographic characteristics associated with opioids prescribing.

Method: This study analyzed data from the 2014 to 2015 National Ambulatory Medical Care Survey and included primary care visits by adult patients (aged 18 years or older) with noncancer pain.

Results: An opioid medication was prescribed in 26.4% (95% CI, 22.6% to 30.6%) of the primary care visits by patients with noncancer pain. Opioid medications were more likely to be prescribed during visits by patients with a pain and depression dyad (adjusted odds ratios [AOR] = 1.8; 95% CI, 1.4 to 2.4). Narcotic analgesics were more likely to be prescribed during visits by patients aged 46 to 64 years; by male patients or non-Hispanic white patients.

Discussion/Conclusions: Pain-depression dyad is associated with higher odds of opioids prescribing during primary care visits. Future studies are needed to understand the complexity of these factors and identify effective strategies to prevent opioids addiction and overdose among patients with pain and depression. (J Am Board Fam Med 2019;32:614–618.)

Keywords: Depression, Drug Overdose, Health Care Surveys, Narcotics, Opioid Analgesics, Pain, Prescriptions, Primary Health Care, Public Health

Increased opioid overdose deaths have become a serious public health problem in the United States.^{1–3} It is disconcerting that many opioid overdose deaths are directly related to taking opioids as prescribed.⁴ Overprescription, long durations of therapy, and high doses of opioid medications have been considered factors driving the epidemic.^{5,6} Opioid analgesic medications are often prescribed

to treat both acute and chronic pain^{7,8} and if prescribed to patients with comorbidities, patients can have a higher risk for opioid addiction and overdose. Studies have reported that patients with pain and mental health problems are more likely to use opioids for pain treatment.^{9,10} Other studies have found that patients with pain and depression more frequently receive opioid prescriptions at higher doses^{5,11,12} and have longer durations of use.¹³ Moreover, people with depression comorbid condition without substance use history are more likely to use opioids for other conditions and increase dosages.¹⁴

Patients with pain and depression are often treated in primary care settings. An estimated half of dispensed opioid prescriptions originate from primary care providers in America;¹⁵ therefore, the US Centers for Disease Control and Prevention (CDC) guidelines target primary care providers as

This article was externally peer reviewed.

Submitted 18 October 2018; revised 25 March 2019; accepted 28 March 2019.

From the Center for Family and Community Medicine, Columbia University Irving Medical Center, New York, NY (SXL, KP, RGY); St. John's University College of Pharmacy and Health Sciences, Queens, NY (KP); New York Presbyterian Hospital, New York, NY (RGY).

Funding: none.

Conflict of interest: none declared.

Corresponding author: Susan X. Lin, DrPH. The Center for Family and Community Medicine, Columbia University Irving Medical Center, New York, NY (E-mail: XL18@columbia.edu).

a strategy to curb opioid prescriptions.¹⁶ There are both clinical and policy implications to understand the dynamics of opioids prescribing during primary care visits. Aside from a few studies that examined opioid medication prescribing in ambulatory care settings,^{11,17} there is a lack of large empirical data to examine the frequency of opioid prescribing during primary visits to patients with noncancer pain and depression in primary care. This study examined the demographic characteristics of primary care visits by patients with a pain-depression dyad, and the association between opioid prescribing and primary care visits with a pain-depression dyad.

Methods

We analyzed data from the 2014 to 2015 National Ambulatory Medical Care Survey (NAMCS), a national probability sample survey of ambulatory medical visits to office-based physicians conducted by the National Center for Health Statistics of the CDC. Detailed information about the survey can be accessed on the CDC Web site. The NAMCS data are publicly accessible. This study included visits of adult patients (aged 18 years or older) with noncancer pain to primary care providers (general/family medicine, internal medicine, pediatrics, and OB/GYN). The 2014 to 2015 NAMCS includes up to 5 reasons for visit and 3 ICD9 codes. Noncancer pain was determined by any reason for visit that involved pain (lower back, musculoskeletal, headache, abdominal, or generalized pain disorders) or ICD9 codes for pain. In this article, the pain-depression dyad is defined as patients with a diagnosis code for depression and pain as described above.

Opioid medications, the outcome variable, were identified using Multum drug classification category 060 (narcotic analgesics) or 191 (narcotic analgesic combinations) from up to 30 medications recorded during a visit. A diagnosis of depression was based on ICD9 codes (296.2, 296.3, 309.0, 309.1, 311). Logistic regression was used to characterize the demographic feature of visits of patients with a pain-depression dyad and examine the association of opioid prescribing with the pain-depression dyad. To account for the complex sampling design of the NAMCS, we used IBM SPSS 24 software complex sample module for analysis. Weighted data were used in the analysis. Estimates and standard error or 95% CI of the estimates were calculated.

Results

An estimated 715 million visits were made to primary care providers in 2014 and 2015 by adult patients without malignancy; 32.8% (95% CI, 30.7% to 35%) visits made by patients with noncancer pain. Of all visits by patients with noncancer pain, 12.3% (95% CI, 10.4% to 14.4%) had comorbidity of depression.

Visits by patients with a pain-depression dyad (Table 1) were more likely to occur in patients aged 46 to 64 years compared with those 18 to 34 years old (14.45% vs 9.5%; adjusted odds ratios [AOR] = 1.7; 95% CI, 1.2 to 2.4); among female patients compared with male patients (14.3% vs 8.6%) (AOR = 2; 95% CI, 1.6 to 2.4); and less likely to occur among minority patients (5.8% among non-Hispanic Black patients, 8% among Hispanic patients) compared with non-Hispanic white patients (15.7%).

Overall, opioid medications were prescribed in 26.4% (95% CI, 22.6% to 30.6%) of the total weighted primary care visits by patients with noncancer pain. Narcotic analgesics were almost twice more likely to be prescribed during visits by patients with a pain-depression dyad than by those without these comorbidities (AOR = 1.8; 95% CI, 1.4 to 2.4; Table 2). Narcotic analgesics were also more likely to be prescribed during visits by patients aged 46 to 64 years compared with those aged 18 to 34 years; by male patients (AOR = 1.5; 95% CI, 1.2 to 1.8); by non-Hispanic white patients when compared with minority groups.

Discussion

Patient primary care visits for noncancer pain are common and about a quarter of these visits involved opioid medication prescribing. It is beyond the scope of this study to identify specific reasons for the association of a pain-depression dyad with higher odds of opioid medication prescribing during primary care visits. Given the reciprocal and bidirectional association between pain and depression,¹⁸ it is possible that patients with chronic severe pain can become depressed and have increased need for opioids therapy. Depression can complicate the pain treatment which may result in more pain. As efficacy studies of opioids to treat pain normally exclude patients with depression and other comorbidities,¹⁹ more research evidence is needed to describe the benefits, safety and risk associated with opioid med-

Table 1. Demographic Characteristics of Primary Care Visits by Patients With Pain-Depression Dyad

	Visits by Patients with Pain-Depression Dyad (N = 6507)		AOR (95% CI)	P-Value
	Yes (N = 975), Weighted %	No (N = 5532), Weighted %		
All visits	12.3	81.7		
Age, years (%)				.004
17 to 34	9.5	90.5	Reference	
35 to 45	12.4	87.6	1.4 (0.9 to 2.1)	
46 to 64	14.4	85.6	1.7 (1.2 to 2.4)	
65 to 74	12.0	88	1.3 (0.9 to 1.9)	
75+	9.4	90.6	0.96 (0.6 to 1.6)	
Sex				
Male	8.6	91.4	Reference	<.0001
Female	14.3	85.7	2.0 (1.6–2.4)	
Race/ethnicity				<.0001
Non-Hispanic white	15.7	84.3	Reference	
Non-Hispanic black	5.8	94.2	0.30 (0.21 to 0.44)	
Hispanic	8.0	92	0.45 (0.27 to 0.75)	
Other	4.5	95.5	0.25 (0.13 to 0.50)	

AOR, adjusted odds ratio; CI, confidential interval.

ications to treat patient with a pain-depression dyad.

Our study findings highlight the importance of closely monitoring opioids prescribing for patients with a pain-depression dyad in primary care setting.

As depression is a marker for increased risk for opioid addiction and overdose,²⁰ the treatment of depression plays an important role in addressing the disparate use of opioids within this subgroup. In addition assessment of addiction risks before opi-

Table 2. Opioid Medication Prescribing During Primary Care Visits Associated With Pain-Depression Dyad

	Opioid Medication Prescribing		AOR (95% CI)	P-Value
	Yes (N = 1748), Weighted %	No (N = 4759), Weighted %		
All visits	26.4	72.6		
Pain-depression dyad				<.0001
Yes	39.1	60.9	1.8 (1.4 to 2.4)	
No	24.6	75.4	Reference	
Age, years		100		.003
17 to 34	18.5	81.5	Reference	
35 to 45	26.6	73.4	1.6 (1.04 to 2.4)	
46 to 64	31.2	68.8	1.9 (1.3 to 2.9)	
65 to 74	24.1	75.9	1.4 (0.8 to 2.3)	
75+	23.8	76.2	1.3 (0.8 to 2.3)	
Sex				.001
Male	31.2	68.8	1.5 (1.2 to 1.8)	
Female	23.7	76.3	Reference	
Race/ethnicity				<.0001
Non-Hispanic white	30.8	69.2	Reference	
Non-Hispanic black	20.9	79.1	0.6 (0.4 to 0.9)	
Hispanic	20.2	79.8	0.6 (0.4 to 0.9)	
Other	12.1	87.9	0.3 (0.2 to 0.6)	

AOR, adjusted odds ratio; CI, confidential interval.

oids initiation is recommended.²¹ and repeat screening for depression after opioid initiation may help to identify patients at risk for unintentional overdose.

This study also found some demographic characteristics were associated with the pain-depression dyad and opioids prescriptions. Visits by patients between 45 and 65 years old are more likely to involve pain and depression compared with visits by younger patients (17 to 34 years old). Middle age is a risk factor for opioid overdose death.²² The pain-depression dyad was less common in male patients, but men were more likely to be prescribed opioids compared with visits by female patients. It is not clear whether these differences are accounted for by gender differences in pain severity, level of pain tolerance, or affective processing of pain that require opioids medication more among male patients than among female patients. White patients were more likely than minority patients to have a pain-depression dyad and have a higher odds of getting opioid medication during their primary care visits. These findings may suggest under treatment of pain among Black and Hispanic Americans as documented in the literature.²³ Further studies are warranted to understand the implications of gender and racial/ethnic differences in pain and pain treatment.

There are some limitations to this study. The collected data are based on visit encounters, so the percentage of patients who obtained an opioid after receiving a prescription is unknown. It is not possible to examine a pre-existing dyad or whether opioids induced depression. No information is available to describe the initiation or duration of opioid medications or pain severity and pain duration among patients.

In summary, our study found opioid prescriptions were more likely to occur during primary care visits made by patients with the pain-depression dyad. Further investigation is needed to understand the complex factors that influence misuse, addiction, and opioid-involved overdose deaths among at risk patients in primary care.

We thank all physicians and health care providers and their patients who provided encounter data in the NAMCS survey and the CDC National Center for Health Statistics for providing the data files and the analytic guidelines.

To see this article online, please go to: <http://jabfm.org/content/32/4/614.full>.

References

1. Hedegaard H, Warner M, Minino AM. Drug overdose deaths in the United States, 1999–2016. NCHS Data Brief 2017;294:1–8.
2. Han B, Compton WM, Blanco C, et al. Prescription opioid use, misuse, and use disorders in U.S. adults: 2015 National Survey on Drug Use and Health. *Ann Intern Med* 2017;167:293–301.
3. Seth P, Rudd RA, Noonan RK, Haegerich TM. Quantifying the epidemic of prescription opioid overdose deaths. *American journal of public health* 2018;108:500–502.
4. Manchikanti L, Helm S 2nd, Fellows B, et al. Opioid epidemic in the United States. *Pain Physician* 2012; 15(3 Suppl):Es9–Es38.
5. Park TW, Lin LA, Hosanagar A, et al. Understanding risk factors for opioid overdose in clinical populations to inform treatment and policy. *J Addict Med* 2016;10:369–381.
6. Compton WM, Boyle M, Wargo E. Prescription opioid abuse: Problems and responses. *Prev Med* 2015;80:5–9.
7. Caudill-Slosberg MA, Schwartz LM, Woloshin S. Office visits and analgesic prescriptions for musculoskeletal pain in US: 1980 vs. 2000. *Pain* 2004;109: 514–519.
8. Dorn SD, Meek PD, Shah ND. Increasing frequency of opioid prescriptions for chronic abdominal pain in US outpatient clinics. *Clin Gastroenterol Hepatol* 2011;9:1078–1085.e1071.
9. Halbert BT, Davis RB, Wee CC. Disproportionate longer-term opioid use among U.S. adults with mood disorders. *Pain* 2016;157:2452–2457.
10. Seal KH, Shi Y, Cohen G, et al. Association of mental health disorders with prescription opioids and high-risk opioid use in US veterans of Iraq and Afghanistan. *JAMA* 2012;307:940–947.
11. Olsen Y, Daumit GL, Ford DE. Opioid prescriptions by U.S. primary care physicians from 1992 to 2001. *J Pain* 2006;7:225–235.
12. Scherrer JF, Salas J, Copeland LA, et al. Increased risk of depression recurrence after initiation of prescription opioids in noncancer pain patients. *J Pain* 2016;17:473–482.
13. Edlund MJ, Martin BC, Devries A, et al. Trends in use of opioids for chronic noncancer pain among individuals with mental health and substance use disorders: the TROUP study. *Clin J Pain* 2010;26: 1–8.
14. Grattan A, Sullivan MD, Saunders KW, et al. Depression and prescription opioid misuse among chronic opioid therapy recipients with no history of substance abuse. *Ann Fam Med* 2012;10:304–311.

15. Levy B, Paulozzi L, Mack KA, et al. Trends in opioid analgesic-prescribing rates by specialty, U.S., 2007–2012. *Am J Prev Med* 2015;49:409–413.
16. Dowell D, Haegerich TM, Chou R. CDC guideline for prescribing opioids for chronic pain—United States, 2016. *JAMA* 2016;315:1624–1645.
17. Rasu RS, Knell ME. Determinants of opioid prescribing for nonmalignant chronic pain in us outpatient settings. *Pain Med* 2018;19:524–532.
18. Kroenke K, Wu J, Bair MJ, et al. Reciprocal relationship between pain and depression: A 12-month longitudinal analysis in primary care. *J Pain* 2011;12:964–973.
19. Braden JB, Sullivan MD, Ray GT, et al. Trends in long-term opioid therapy for noncancer pain among persons with a history of depression. *Gen Hosp Psychiatry* 2009;31:564–570.
20. Volkow N, Benveniste H, McLellan AT. Use and misuse of opioids in chronic pain. *Annu Rev Med* 2018;69:451–465.
21. Volkow ND, McLellan AT. Opioid abuse in chronic pain—Misconceptions and mitigation strategies. *N Engl J Med* 2016;374:1253–1263.
22. Webster LR. Risk factors for opioid-use disorder and overdose. *Anesth Analg* 2017;125:1741–1748.
23. Meghani SH, Polomano RC, Tait RC, et al. Advancing a national agenda to eliminate disparities in pain care: Directions for health policy, education, practice, and research. *Pain Med* 2012;13:5–28.