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RESEARCH ARTICLE

Opioid Prescriptions for Acute and Chronic Pain Management Among Medicaid Beneficiaries

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Introduction: Millions of Americans are affected by acute or chronic pain every year. This study investigates opioid prescription patterns for acute and chronic pain management among U.S. Medicaid patients.

Methods: The study used medical and pharmacy claims data obtained from the multistate Truven MarketScan Medicaid Database from 2013 to 2015 for Medicaid patients receiving health care. Medicaid beneficiaries who utilized an outpatient healthcare facility for back pain, neck pain (cervicalgia), joint pain (osteoarthritis and rheumatoid arthritis), orthopedics (simple/closed fractures and muscle strains/sprains), headache (cluster headaches and migraines), dental conditions, or otorhinolaryngologic (otalgia) diagnoses, based on the International Classification of Diseases, Ninth Revision, Clinical Modification diagnosis codes, and received an opioid prescription within 14 days of diagnosis were included in this study.

Results: There were 5,051,288 patients with 1 of the 7 diagnostic groupings; 18.8% had an opioid prescription filled within 14 days of diagnosis. Orthopedic pain (34.8%) was the primary reason for an opioid prescription, followed by dental conditions (17.3%), back pain (14.0%), and headache (12.9%). Patients receiving an opioid for conditions associated with acute pain management, such as otorhinolaryngologic (OR=1.93, 95% CI=1.85, 2.0), dental (OR=1.50, 95% CI=1.48, 1.53), or orthopedic conditions (OR=1.31, 95% CI=1.29, 1.32), were more likely to receive the prescription from an emergency department provider versus a general practitioner. However, compared with general practitioners, other providers were more likely to prescribe opioids for conditions associated with chronic pain management.

Conclusions: More than half of Medicaid beneficiaries receiving an opioid for pain management do so for orthopedic- and dental-related reasons, with emergency department providers more likely to prescribe opioids. Modifications to the guidelines addressing temporary acute pain management practices with opioids would be likely to benefit emergency department providers the most.

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INTRODUCTION

Millions of Americans are affected by acute or chronic pain every year.[1] In primary care settings, pain represents the most commonly addressed complaint, with nearly two thirds of emergency department (ED) patients treated for pain-related conditions.[2] Moreover, individuals with severe pain are more likely to use healthcare services and experience inferior health outcomes than individuals with little or no pain.[3] The number of Americans affected by pain is higher than those affected by diabetes, heart disease, and

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cancer combined.[4] Pain is also costly to the healthcare system and the overall economy, with annual costs ranging between $560 and $635 billion accounting for medical management, disability days, lost wages, and reduced productivity.[5] Prescription analgesic misuse alone costs an estimated $55 billion a year in lost productivity.[5]

Clinically, pain is classified as either chronic or acute.[6] Chronic pain is defined as noncancerous, nonend of life pain lasting 3 months or longer than the duration of normal tissue healing. It manifests as continuous or intermittent episodes with or without acute exacerbations. Examples of chronic pain include low back pain, severe headache or migraine, and arthritis. Acute pain is usually concordant with the degree of tissue damage, which remits with resolution of the injury. It also reflects the activation of nociceptors and sensitized central neurons and does not outlast the normal time of healing (<6 weeks) if associated with a disease or injury. Examples of acute pain include dental pain, postoperative pain, and pain associated with appendicitis, bone fracture, or myocardial infarction.

Opioid-based medications have been used to manage severe pain, including cancer-related pain and end-of-life care. Although endogenous opioids were discovered in the 1970s, substantial changes in opioid prescribing patterns began in the late 1990s when chronic pain became more widely recognized as a sign of a debilitating health condition rather than a symptom of an adverse health event, resulting in healthcare providers (HCPs) managing chronic pain more frequently with opioids.[7] The U.S. comprises only 5% of the world's population, yet Americans consume 80% of the world's opioid pain medications, including 99% of the world's hydrocodone.[8] In 2016, there were 214 million opioid prescriptions dispensed in the U.S. at a rate of 66 prescriptions per 100 people per year.[9,10] Although this suggests the rate of opioid prescriptions is constant throughout the year, little is known if opioid prescribing patterns vary temporally by day, week, or month.

There are important issues that justify considering pain as a public health challenge. The increased use of opioids for legitimate medical purposes has been accompanied by a substantial increase in the prevalence of nonmedical and nonprescribed misuse of opioid drugs.[11] This adversely affects many groups, but its effect on low-income populations contributes to broader societal costs, and the lack of comprehensive pain management strategies leads to widespread treatment inequalities at both the individual and population levels.[12] Pain management disparities have been documented with regard to patient race/ethnicity,[13–17] gender, and SES.[14] Although studies have assessed chronic and acute pain management with opioids individually,[18–25] none have compared opioid prescribing patterns between acute and chronic pain in a low-income population such as Medicaid beneficiaries. This is important because low-income populations are prescribed opioid drugs at twice the rate of higher-income or non-Medicaid populations and are 3 to 6 times more likely to overdose.[26] The purpose of this study was to investigate opioid prescribing patterns for diagnoses associated with acute and chronic pain among Medicaid patients.

METHODS

Study Sample

Medical and pharmacy Medicaid claims data from the IBM MarketScan Database multistate Medicaid core data set (https://truvenhealth.com/markets/life-sciences/products/data-tools/marketscan-databases) were analyzed. These data cover 13 U.S. states and contain no geographic or personal identifiers. Person-level data (e.g., age, gender, and enrollment period) and claims-level data (e.g., outpatient pharmacy prescription claims) for the period between January 1, 2013 and September 30, 2015 were used. A record of all Medicaid patients who received ambulatory or outpatient health care was generated to obtain person-level data.[27] People with back pain; neck pain (cervicalgia); joint pain (osteoarthritis and rheumatoid arthritis); orthopedic-related conditions (simple, closed fractures, muscle strains/sprains); headache-related pain (including cluster headaches and migraine pain); dental-related diagnoses (excluding temporomandibular joint conditions); or ear, nose, and throat (ENT)-related diagnoses (otalgia), using the International Classification of Diseases, Ninth Revision, Clinical Modification diagnosis codes (Appendix Table 1, available online), were identified. These 7 conditions were selected to broadly represent various pain conditions classified as chronic (back pain, neck pain, joint pain, and headache) and acute (dental-, ENT-, and orthopedic-related pains). Individuals were included if they had an outpatient claim with a diagnosis of 1 of these 7 identified conditions.

Measures

Outpatient pharmacy claims were searched for opioid-containing medications using the therapeutic class "opioid analgesics group." This includes drugs derived from opium, including morphine, as well as semisynthetic and synthetic drugs, such as hydrocodone, oxycodone, and fentanyl. Individuals who received a prescription for any opioid analgesic within 14 days of diagnosis for 1 of the 7 pain-related conditions were selected. The analytical data set consisted of medical and pharmacy records linked by the unique patient identifier corresponding to the visit timing described previously. This study received an exemption from IRB review from NIH.

Receipt of an opioid prescription within 14 days of the initial diagnosis, categorized dichotomously (yes or no), was the primary outcome variable. The HCP source was categorized into ED providers (ED-HCPs), general practitioners (GPs), nurse practitioner (NP) or physician assistants (PA), and other HCPs. Other HCPs included dentists, medical specialists, and many other types, including nonspecified providers. The majority were listed as "other facilities" (~29%) and "radiology" (~15%). A full list is

available upon request to the authors. Patient variables included age group (≤18, 19–29, 30–39, 40–49, 50–64, and ≥65 years), gender, and race/ethnicity (Hispanics, non-Hispanic whites, African Americans, and other). Additional covariates were created to indicate when a prescription was dispensed based on the day of the week and month of the year.

Statistical Analysis

Frequency distributions and proportions of patients with an opioid prescription were calculated by age group, gender, race/ethnicity, and provider type and were stratified by diagnosis type (chronic or acute). Individual multivariable logistic regression models were produced to ascertain the association of the key independent variable (diagnostic classification) with the dependent variable (receipt of an opioid within 14 days of diagnosis) while controlling for other covariates (age, HCPs, gender, and race/ethnicity). GPs were used as the reference provider in the logistic regression analyses. Analyses were performed using SAS, version 9.4.

RESULTS

Among the 16,354,975 Medicaid beneficiaries with claims between January 1, 2013 and September 30, 2015, there were 5,720,686 people identified with 1 of the 7 diagnostic classifications. Individuals with missing information regarding their gender (*n*=367), HCP source (*n*=668,886), and age (*n*=269) were excluded, yielding a final analytical sample of 5,051,288 people. From this group, 950,154 filled an opioid prescription within 14 days of their diagnosis.

Among the 18.8% of Medicaid patients with 1 of the 7 diagnostic classifications of interest and receiving an opioid prescription within 14 days of diagnosis, more than half were aged ≥30 years and <14.62% were aged ≤18 years (Appendix Table 2, available online). More than two thirds were female (65.46%), and non-Hispanic whites were the majority race/ethnic group (59.65%). The highest proportion received opioids for orthopedic pain (34.83%), followed by dental pain (17.32%), back pain (13.98%), headache (12.94%), joint pain (9.49%), and ENT-related pain (1.73%).

The distribution of patients receiving opioids within 14 days of a select diagnosis by HCP source is presented in Table 1. The highest percentage of opioid prescriptions for acute pain conditions, such as dental (51.54%) and

Table 1. Distribution of Medicaid Patients Receiving Opioids Within 14 Days of Selected Diagnosis by Healthcare Provider

Characteristics	ED-HCPs, *n* (%)[a]	Physicians, *n* (%)[a]	NP/PA, *n* (%)[a]	Other HCPs, *n* (%)[a]	Total, *n* (%)[b]
Overall, N (%)	359,737 (37.86)	326,610 (34.37)	44,482 (4.68)	219,325 (23.08)	950,154 (100)
Age, years					
≤18	63,423 (45.66)	36,806 (26.50)	7,223 (5.20)	31,452 (22.64)	138,904 (14.62)
19–29	83,377 (45.36)	60,542 (32.93)	9,411 (5.12)	30,496 (16.59)	183,826 (19.35)
30–39	88,277 (39.66)	81,766 (36.73)	11,037 (4.96)	41,514 (18.65)	222,594 (23.43)
40–49	58,479 (33.58)	65,019 (37.34)	7,735 (4.44)	42,893 (24.63)	174,126 (18.33)
50–64	61,375 (29.04)	77,670 (36.75)	8,677 (4.11)	63,612 (30.10)	211,334 (22.24)
≥65	4,806 (24.81)	4,807 (24.82)	399 (2.06)	9,358 (48.31)	19,370 (2.04)
Sex					
Female	233,197 (37.49)	216,470 (34.81)	30,149 (4.85)	142,133 (22.85)	621,949 (65.46)
Male	126,540 (38.56)	110,140 (33.56)	14,333 (4.37)	77,192 (23.52)	328,205 (34.54)
Race/ethnicity					
Non-Hispanic white	205,971 (36.34)	199,013 (35.11)	24,274 (4.28)	137,532 (24.27)	566,790 (59.65)
African American	89,596 (38.86)	81,214 (35.23)	13,078 (5.67)	46,665 (20.24)	230,553 (24.26)
Hispanic	7,511 (37.72)	5,912 (29.69)	777 (3.90)	5,713 (28.69)	19,913 (2.10)
Other	56,659 (42.63)	40,471 (30.45)	6,353 (4.78)	29,415 (22.13)	132,898 (13.99)
Diagnostic classifications					
Dental	84,837 (51.54)	37,285 (22.65)	9,270 (5.63)	33,209 (20.18)	164,601 (17.32)
Orthopedic	165,022 (49.86)	96,317 (29.10)	16,198 (4.89)	53,401 (16.14)	330,938 (34.83)
ENT	5,878 (35.68)	6,430 (39.03)	1,242 (7.54)	2,925 (17.75)	16,475 (1.73)
Headache	37,744 (30.70)	51,891 (42.21)	5,119 (4.16)	28,186 (22.93)	122,940 (12.94)
Back pain	37,511 (28.24)	54,482 (41.02)	6,105 (4.60)	34,730 (26.15)	132,828 (13.98)
Joint pain	11,210 (12.43)	39,889 (44.22)	2,692 (2.98)	36,405 (40.36)	90,196 (9.49)
Neck pain	17,535 (19.02)	40,316 (43.74)	3,856 (4.18)	30,469 (33.06)	92,176 (9.70)

[a]Column percent of the total.
[b]Row percent of the total.
ED, emergency department; ENT, ear, nose, and throat; HCP, healthcare provider; NP, nurse practitioner; PA, physician assistant.

Table 2. Multivariable Regression Results Estimating the Probability of Medicaid Patients Receiving an Opioid Within 14 Days of a Selected Diagnosis

Variables	Dental, OR (95% CI)	Orthopedic, OR (95% CI)	ENT, OR (95% CI)	Headache, OR (95% CI)	Back pain, OR (95% CI)	Joint pain, OR (95% CI)	Neck pain, OR (95% CI)
Age, years							
<18	ref	ref	ref	ref	ref	ref	ref
19–29	6.26 (6.16, 6.37)	2.47 (2.44, 2.50)	9.88 (9.39, 10.38)	6.03 (5.90, 6.18)	6.27 (6.07, 6.48)	2.49 (2.26, 2.76)	4.78 (4.59, 4.95)
30–39	6.93 (6.82, 7.06)	3.53 (3.49, 3.57)	13.61 (12.95, 14.3)	8.19 (8.01, 8.39)	9.32 (9.03, 9.64)	3.03 (2.76, 3.33)	6.25 (6.03, 6.48)
40–49	5.53 (5.42, 5.65)	3.36 (3.32, 3.4)	13.65 (12.92, 14.42)	8.21 (8.02, 8.42)	8.83 (8.55, 9.12)	2.51 (2.29, 2.76)	5.69 (5.5, 5.91)
50–64	4.16 (4.08, 4.25)	2.79 (2.76, 2.83)	11.65 (11.04, 12.3)	7.43 (7.25, 7.61)	7.39 (7.17, 7.64)	1.91 (1.75, 2.10)	4.8 (4.64, 4.97)
≥65	0.54 (0.51, 0.58)	0.38 (0.37, 0.4)	1.69 (1.47, 1.94)	1.11 (1.08, 1.22)	1.22 (1.16, 1.27)	0.25 (0.23, 0.27)	0.67 (0.63, 0.71)
Healthcare providers							
Physician	ref	ref	ref	ref	ref	ref	ref
ED-HCPs	1.50 (1.48, 1.53)	1.31 (1.29, 1.32)	1.93 (1.85, 2.00)	1.04 (1.03, 1.06)	1.09 (1.08, 1.11)	0.95 (0.93, 0.97)	0.91 (0.89, 0.93)
NP/PA	1.05 (1.02, 1.08)	1.02 (1.00, 1.04)	1.08 (1.02, 1.16)	0.88 (0.86, 0.91)	0.89 (0.87, 0.92)	1.00 (0.96, 1.05)	0.94 (0.91, 0.98)
Other HCPs	0.47 (0.47, 0.48)	0.96 (0.95, 0.97)	0.96 (0.92, 1.01)	0.92 (0.9, 0.93)	1.09 (1.08, 1.11)	1.14 (1.12, 1.16)	1.08 (1.06, 1.10)
Sex							
Male	ref	ref	ref	ref	ref	ref	ref
Female	1.17 (1.15, 1.18)	0.92 (0.92, 0.93)	1.10 (1.06, 1.15)	1.05 (1.04, 1.07)	0.97 (0.96, 0.99)	0.87 (0.85, 0.88)	0.98 (0.96, 0.99)
Race/ethnicity							
Hispanic	ref	ref	ref	ref	ref	ref	ref
Non-Hispanic white	1.56 (1.51, 1.61)	1.09 (1.07, 1.13)	1.37 (1.24, 1.52)	1.56 (1.5, 1.63)	1.50 (1.43, 1.58)	1.50 (1.41, 1.61)	1.55 (1.46, 1.65)
African American	1.51 (1.46, 1.57)	0.89 (0.87, 0.91)	1.03 (0.94, 1.15)	1.16 (1.11, 1.22)	1.07 (1.02, 1.13)	1.18 (1.1, 1.26)	1.25 (1.18, 1.34)
Others	1.44 (1.39, 1.49)	1.00 (0.98, 1.03)	1.06 (0.95, 1.18)	1.34 (1.29, 1.41)	1.35 (1.28, 1.42)	1.38 (1.29, 1.48)	1.43 (1.34, 1.53)

Note: Dependent variable is the receipt of an opioid prescription within 14 days for 1 of the 7 selected diagnostic groups. Models used age, gender, sex, race/ethnicity, and health provider types as independent variables.
ED, emergency department; ENT, ear, nose, and throat; HCP, healthcare provider; NP, nurse practitioner; PA, physician assistant.

orthopedic (49.86%) conditions, were provided by ED-HCPs. By comparison, the highest percentage of opioid prescription for chronic pain conditions, such as headache, back pain, joint pain, and neck pain, was prescribed by GPs. The one outlier in this pattern was that GPs also prescribed more than one third of the opioids for ENT diagnoses. ED-HCPs and GPs accounted for most of the opioid prescriptions for orthopedic (78.96%), ENT (74.71%), dental (74.19%), headache (72.91%), and back pain (69.26%). NPs/PAs prescribed opioids the least (3%–8%) regardless of the type of pain condition.

Compared with GPs, ED-HCPs were more likely to prescribe opioids to patients with acute pain conditions with an orthopedic (OR=1.31, 95% CI=1.29, 1.32), dental (OR=1.50, 95% CI=1.48, 1.53), or ENT (OR=1.93, 95% CI=1.85, 2.0) origin when controlling for patient characteristics such as age, gender, and race/ethnicity (Table 2). Similarly, compared with GPs, NPs/PAs were more likely to prescribe opioids for acute pain conditions, such as orthopedic (OR=1.02, 95% CI=1.0, 1.04), dental (OR=1.05, 95% CI=1.02, 1.08), or ENT (otalgia) (OR=1.08, 95% CI=1.02, 1.16) and less likely to prescribe opioids for chronic pain conditions, such as headache (OR=0.88, 95% CI=0.86, 0.91), back pain (OR=0.89, 95% CI=0.87, 0.92), or neck pain (OR=0.94, 95% CI=0.91, 0.98). Compared with GPs, other HCPs were less likely to prescribe an opioid for dental, orthopedic, and headache pain and were more likely to provide an opioid for back or neck pain.

Regarding gender differences, female patients were more likely to receive opioids for dental- (OR=1.17, 95% CI=1.15, 1.18) and ENT-related diagnoses (OR=1.1, 95% CI=1.06, 1.15) compared with male patients, with the exception of orthopedic pain (OR=0.92, 95%

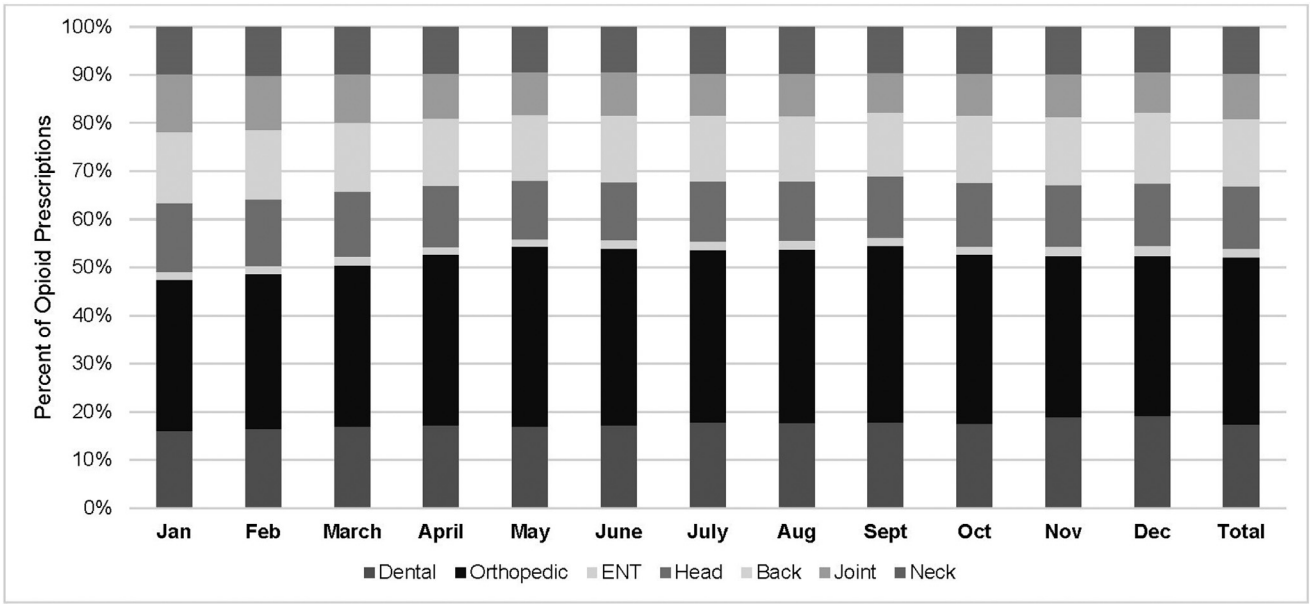

Figure 1. Dispensation of the opioid prescriptions for each month year by select diagnosis.
ENT, ear, nose, and throat.

CI=0.92, 0.93). However, male patients with chronic pain diagnoses, such as backache (OR=0.97, 95% CI=0.96, 0.99), joint pain (OR=0.87, 95% CI=0.85, 0.88), and neck pain (OR=0.98, 95% CI=0.96, 0.99), were more likely to receive an opioid than female patients.

Race/ethnicity differences were also apparent. Non-Hispanic whites were more likely to receive an opioid prescription than Hispanics for all 7 selected diagnoses. African Americans were more likely to receive an opioid prescription for chronic conditions (headache, back pain, joint pain, and neck pain) and for 1 of the 3 acute pain conditions (dental pain: OR=1.51, 95% CI=1.46, 1.57) compared with non-Hispanic whites. Overall, Hispanics were less likely to receive an opioid prescription than other race/ethnic groups for the 7 diagnoses evaluated.

There were some seasonal associations with the receipt of opioids over the calendar year (Figure 1). Generally, at least half of all opioid prescriptions were for acute pain management of issues related to dental and orthopedic conditions during most months. A small increase in the proportions of opioid prescription for these conditions was observed from spring through the summer (March–September). When evaluating these 2 conditions combined, not as a proportion, the highest number of prescriptions were in May (49,252) (Appendix Table 3, available online). January had the highest number of opioid prescriptions for dental-related conditions (16,271). For some chronic pain conditions, especially joint pain, there was a higher proportion of opioid prescriptions in January and February.

There were more pronounced differences in opioid prescription for pain management by the day of the week (Figure 2). There was an increase in opioid prescriptions for acute conditions, especially related to dental (~20%) and orthopedic (~44%) conditions on Saturday and Sunday compared with the rest of the week, whereas receipt of an opioid for some chronic conditions, such as back pain (~15%), joint pain, neck pain, and headache (~13%), were higher on Monday through Friday compared with the weekend. ENT-related pain did not show any variation for opioid prescription by day of the week.

The volume of opioids prescribed for the 7 evaluated diagnostic groups in relation to the day of the week is presented as a Tree Map (Appendix Figure 1, available online). Saturday and Sunday had the lowest overall volume of opioid prescriptions compared with other days of the week. However, the numbers prescribed for acute pain conditions, such as those of dental and orthopedic origins, represented a greater share of the overall volume of opioids prescribed on those 2 days compared with Monday through Friday. The highest single day for opioid prescriptions for both orthopedic and dental diagnoses was Monday (171,253) (Appendix Table 4, available online).

DISCUSSION

Recently, the management of noncancerous pain with opioids has been at the forefront of a national

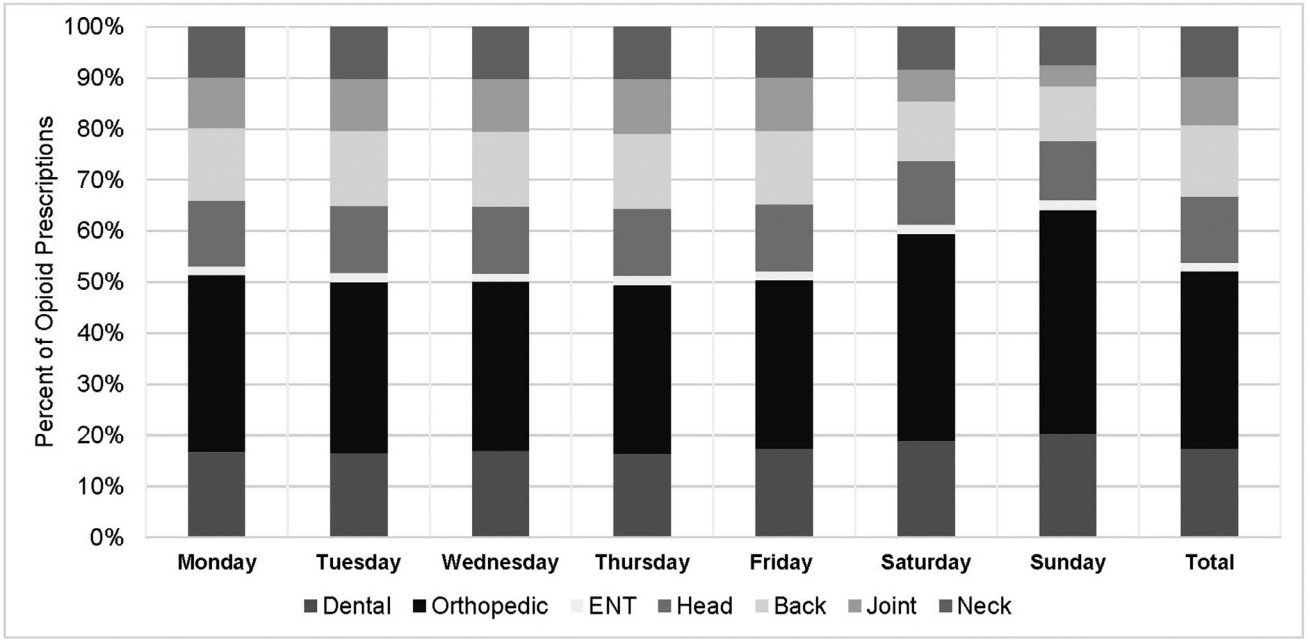

Figure 2. Dispensation of opioids prescriptions for each weekday by select diagnosis.
ENT, ear, nose, and throat.

conversation. Much of this discussion has focused on determining who is an appropriate candidate for an opioid prescription, what is the correct dosage, and how to prevent opioid-related overdose and accidental death.

The current findings show variations among providers in prescribing opioids. For example, compared with GPs, ED-HCPs and NP/PAs are more likely to provide an opioid for patients with an acute pain condition, such as conditions that are dental- or orthopedic-related, whereas other HCPs are less likely to prescribe opioids for similar acute pain conditions. However, ED-HCPs and NP/PAs differ when prescribing opioids for headache and back pain, although both are less likely to prescribe an opioid for joint or neck pain compared with GPs. Alternatively, other HCPs are more likely to prescribe opioids for chronic conditions, such as backache, joint, and neck pain, rather than for acute pain conditions compared with GPs. Although variations in opioid prescriptions by HCP specialty have been described before for the state of Ohio,[28] it is unclear why these differences exist. Nevertheless, it partially could be related to inconsistencies in practice guidelines for acute pain conditions using opioids, unlike chronic pain management.[29]

As described by Carr and Goudas,[30] even brief intervals of acute pain can induce long-term neuronal remodeling and sensitization ("plasticity"), chronic pain, and lasting psychological distress. It is therefore not surprising that HCPs are likely motivated to treat acute conditions more aggressively to alleviate pain quickly,[31] which may account for the more aggressive prescribing patterns described herein. The risk of depression may increase as pain worsens over time,[32] and this may also influence opioid prescribing patterns and reduce the accuracy of the underlying diagnosis. The Centers for Disease Control and Prevention recently released guidelines on chronic pain but also noted that "long-term opioid use often begins with the treatment of acute pain."[33]

Opioid prescriptions have increased for both men and women, but the increase has been higher for women than for men.[34] The authors found that gender differences in the receipt of opioids vary based on whether the pain is either acute or chronic. For example, female patients were less likely to receive an opioid for orthopedic pain conditions and for back, neck, and joint pain compared with male patients but were more likely to receive an opioid for pain management for dental-, ENT-, and headache-related conditions than male patients. These findings make intuitive sense as men are more likely to experience orthopedic and back pain resulting from occupational injuries or sports, and women are more likely to experience severe migraine headaches. Biopsychosocial mechanisms are hypothesized to contribute to gender differences in acute and chronic pain, including differences in the influence of sex hormones on central and peripheral nervous system function.[35] It has been shown previously that female patients are more likely to report pain, and when they

do, they report more severe pain, more frequent pain, and longer duration of pain than the severity, frequency, and duration of pain reported by male patients.[36] Women are also more likely than men to have depression and anxiety, which are factors that strongly predict both chronic pain and the receipt of opioids. In addition, patient and provider genders may interact, contributing to further variation in ED-HCP pain treatment practices, especially the three-way interaction in physician expertise, physician gender, and patient gender.[37] It has been observed that female ED practitioners were more likely to administer nonopioid analgesics when treating female patients, whereas male physicians used more opioids when treating male patients.[38]

Overall, there was little race/ethnicity difference in the receipt of an opioid between acute and chronic conditions. Non-Hispanic whites were consistently more likely to receive opioids than Hispanics across all assessed conditions. However, these differences were slightly larger among those patients having orthopedic pain or dental-related conditions compared with patients with nondefinitive conditions, such as headache or back, neck, or joint pain.

Patients tended to receive fewer opioid prescriptions during the month of January for all conditions except backache (15%) and joint-related conditions (12%). The reasons for this are uncertain but could be related to delays by patients in seeking health care during the holidays or provider factors related to holiday personnel changes. One such explanation could be that during busier months, when providers have less time to interact with their patients, there are increased rates of prescriptions. The days when the rates of prescriptions were above average also had a higher visit rate per day (27 vs 22 patient visits per day per provider).[39] It has been observed that shorter visits, especially those less than 15 minutes, are a risk factor for inappropriate prescribing patterns.[40]

Limitations

Because of the cross-sectional nature of this study, the authors were unable to explore causal relationships. In addition, the commercial database made available through the licensing agreement was deidentified and contained no geographic indicators to ensure patient confidentiality. Minimally, not knowing the states from which these data were aggregated limits the ability to understand how different state policies regarding Medicaid enrollment could affect the current findings. The authors also did not have dosage information that would allow the exploration of the relationships among morphine milligram equivalents, dosage units, and the key variables of interest, such as provider type and diagnostic groupings. It would also provide a more accurate measure of opioid exposure compared with the number of prescriptions. Finally, data were unavailable for this analysis for 3 months in 2015 (October–December). Additional analyses indicate that this does not significantly affect the interpretation across calendar months when considering the proportions of prescriptions provided, but it potentially affects interpretation when considering the absolute number of prescriptions provided by month. Nevertheless, this study had several strengths. This is the largest study to date to compare opioid prescriptions for acute and chronic pain-related diagnoses in a Medicaid population. This is especially important given that low-income populations receive disproportionately more opioid prescriptions in the U.S. and are more prone to diversion.

CONCLUSIONS

The prescription patterns for acute and chronic pain-related diagnoses differ by the gender and race/ethnicity of patients and by the type of HCP prescribing. There are variations among provider types in prescribing opioids, with ED-HCPs and NP/PAs more likely to prescribe opioids for conditions typically associated with acute pain management. Female patients with acute dental- and ENT-related diagnoses are more likely to receive an opioid, whereas male patients with conditions associated with chronic pain are more likely to receive an opioid. Opioid prescribing patterns also vary by day of the week and the month for these conditions. Understanding opioid prescribing patterns is important for generating hypotheses and identifying research needs that provide information leading to the development of guidelines and policies to prevent the inappropriate use of this important class of medication and improve public health.

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SUPPLEMENTAL MATERIAL

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