BRIEF REPORT

Practice Predictors of Buprenorphine Prescribing by Family Physicians

Lars E. Peterson, MD, PhD, Zachary J. Morgan, MS, and Tyrone F. Borders, PhD

Introduction: **Both opioid use disorder and mortality for opioid overdoses are increasing. Family physicians (FPs) can treat opioid use disorder if they are waivered to prescribe buprenorphine. Our objective was to determine personal, practice, and community characteristics associated with FPs prescribing buprenorphine.**

Methods: **We used data from the 2017 and 2018 American Board of Family Medicine examination registration questionnaire. The questionnaire asked about current prescribing of buprenorphine, as well as about practice size, organization, and location. Logistic regression was used to determine associations between buprenorphine treatment and individual, practice, and county characteristics.**

Results: **The questionnaire had a 100% response rate. After excluding FPs in noncontinuity practices and those who could not be linked to a US county, our final sample was 2726. Only 161 (5.9%) prescribed buprenorphine. Practice in a Federal Qualified Health Center (adjusted Odds Ratio [aOR] = 1.98 (95% CI, 1.08, 3.63)), in solo practice (aOR = 2.60 (1.38, 4.92)), or with a mental health professional (aOR = 2.70 (1.73, 4.22)) were positively associated with prescribing buprenorphine. Practice in a rural county or in a whole county mental health professional shortage area were not associated with buprenorphine prescribing.**

Discussion: **Few FPs prescribed buprenorphine, but those in practice settings with supporting mental health services were more likely to prescribe. With their training in the biopsychosocial model and a more even distribution across the rural continuum, FPs are perfectly situated to meet the increasing need for medication-assisted treatment. However, ensuring they have supporting mental health services will be central to having more FPs provide medication-assisted treatment. (J Am Board Fam Med 2020; 33:118–123.)**

Keywords: **Buprenorphine, Family Physicians, Logistic Models, Mental Health Services, Opioid-Related Disorders, Opioids, Rural Health, Primary Health Care**

In 2017 there were 70,237 drug overdose deaths in the US, with two thirds of these attributed to opioids.[1] Medication-assisted treatment (MAT) with either methadone or buprenorphine is effective in reducing illicit substance use,[2] but access to treatment can be challenging. Buprenorphine can be prescribed by clinicians who have completed additional training as part of their usual practice, but methadone can only be accessed at an outpatient treatment facility that patients visit daily. Analyses of the 2012 waivered clinician registry found that nationally there were 5.8 waivered physicians per 10,000 county residents and that family physicians (FPs) were the second most common physician

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From the American Board of Family Medicine, Lexington, KY (LEP, ZJM); Department of Family and Community Medicine, University of Kentucky, Lexington, KY (LEP); Department of Health Management and Policy, University of Kentucky, Lexington, KY (TFB).

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Corresponding author: Lars E. Peterson, MD, PhD, American Board of Family Medicine, 1648 McGrathiana Parkway, Suite 550, Lexington, KY 40511-1247 (E-mail: lpeterson@theabfm.org).

specialty waivered at 3.6%, behind psychiatry.[3] An update using the 2017 registry found that the availability of any clinician (nurse practitioners and physician assistants gained the ability to become waivered since 2012) with a waiver increased to 10.3 per 10,000 county residents but rural disparities remained.[4] Unfortunately, this updated analysis did not provide a breakdown by specialty, so the rate of growth in buprenorphine waivered FPs is unknown. Evidence of an increase in availability of MAT is corroborated by an analysis of ambulatory care visits from 2006–2008 and 2012–2014, that found the number of primary care visits where buprenorphine was prescribed increased 6.7-fold.[5]

Obtaining a waiver to prescribe buprenorphine is not sufficient for patient access as many physicians with a waiver report not using it.[6] A significant barrier is access to mental health services, as counseling is a critical part of treatment, particularly during initiation. A survey of buprenorphine prescribers found that rural physicians were more likely to have patients use nonintegrated counseling services while physicians in urban areas were more likely to have integrated resources.[7,8] Access to mental health resources is particularly problematic in rural areas due to lower clinician availability.[9,10]

While past research has documented disparities in location and logistic barriers to prescribing buprenorphine, it remains unknown if practice features are associated with prescribing buprenorphine. Our objective was to examine whether rurality of practice location, individual physician and practice characteristics, and county-level mental health services are associated with FPs' prescribing of buprenorphine.

Methods

We used data from the 2017 and 2018 American Board of Family Medicine (ABFM) Family Medicine Certification Examination practice demographic registration questionnaire.[11] The questionnaire is completed by FPs applying to continue their ABFM certification 3 to 4 months before the examination date. It is a required component of the registration process and has a 100% response rate. Examination cohorts are representative of the larger pool of ABFM diplomates.[11] In both years, a representative 20% sample was given a question set, which also yields a 100% response rate, on additional scope of practice items, including buprenorphine prescribing.

Practice features included size, organization, ownership stake, ability to deal with patient's social needs, percent of vulnerable patients, and presence of mental health professionals. Respondents were asked if they provided primarily continuity or noncontinuity (urgent care, hospitalist, emergency, etc.) care and if they held other Board certifications. Practice address was geocoded and we used Rural Urban Continuum Codes 4 to 9 to define rural practice location.[12] County level data on Health Professional Shortage Area (HPSA) for mental health were obtained from the Area Health Resource File. We obtained physician demographics (age, gender, degree type, medical school location) from ABFM administrative datasets.

We dichotomized age at the median (50 years) for analysis. While younger FPs have higher buprenorphine prescribing rates,[13] there were few FPs less than 40 years old in our study cohort to categorize age by decade because the first ABFM continuing certification examination is generally 7 to 10 years after residency graduation. We consolidated Rural Health Clinic, Indian Health Service, and Government clinic nonfederal into an "other public" category for analysis due to small numbers. We created a variable indicating collaborative mental health if the FP indicated any of the following worked collaboratively with them at their practice—Psychiatric Nurse Practitioner, Psychiatrist, Licensed Social Worker, Psychologist/Other Behavioral Health Specialist, non-MD. Mental health HPSA reflected whole-county shortage status.

We limited our sample to those who primarily provided continuity care and whose address was linked to a county. We then described the data and performed bivariate tests for association with buprenorphine prescribing. Prior work found rural buprenorphine prescribers were less likely to be in solo practices.[7] We assessed the relationship between practice size and rurality with buprenorphine prescribing. Then we tested for collinearity and correlation. We found practice ownership was highly correlated with site size; percent vulnerable patients and ability to address social determinants highly correlated with practice organization. Due to these dependencies, we removed ownership, percent vulnerable patients, and ability to address social determinants from the analysis. Finally, we conducted logistic regression analyses to determine associations between personal, practice, and county level characteristics. We assessed the need for a

county clustered analysis by calculating the intraclass correlation and found a value of 20%; however, nearly 90% of our rural sample were in counties by themselves, which inflated this value, and we conducted standard regression analyses. We used SAS Version 9.4 (Cary, NC) for all analyses. Our study was approved by the American Academy of Family Physicians Institutional Review Board.

Results

A total of 18,762 FPs completed the 2017 and 2018 questionnaires and 3753 completed the question set that asked about buprenorphine prescribing. Of these, 25 were excluded due to missing county information and 1002 were excluded for not providing continuity care, leaving a final sample size of 2726. Overall 5.9% prescribed buprenorphine. A majority were male, over age 50 years, white race, and held an MD degree (Table 1). Around a third were in hospital-owned or private practice, with 6.3% in a Federally Qualified Health Center (FQHC). Few FPs were in solo practices and slightly more than a third worked collaboratively with a mental health professional. Fifteen percent resided in a rural county and twenty percent lived in a whole-county mental health HPSA. In bivariate analyses, only presence of a mental health professional and practice organization were associated with buprenorphine prescribing with FPs in FQHCs and academic settings having the highest rates (Table 2). FPs in practices with a mental health professional prescribed buprenorphine at nearly double the rate (8.7% vs 4.4%) of those without.

We analyzed practice size by rural/urban location and found that rural FPs in both solo practice and large practices had higher prescribing rates, with solo rural FPs having the highest rate at 17% (Table 3). None of the 7 solo practice rural physicians indicated they held Addiction Medicine certification.

In adjusted analysis, no personal characteristics were associated with buprenorphine prescribing (Table 4). Working in an FQHC (adjusted Odds Ratio [aOR] = 1.98 (95% CI, 1.08, 3.63)) was positively associated with prescribing while working in a Health Maintenance Organization (aOR = 0.37 (0.14, 0.99)) or hospital-owned practice (aOR = 0.53 (0.33, 0.87)) were negatively associated with prescribing buprenorphine compared with private practice. FPs in solo practices had higher odds of prescribing compared with those in large practices (aOR = 2.60 (1.38, 4.92)). Working collaboratively with a mental health professional was positively associated with prescribing buprenorphine (aOR = 2.70 (1.73, 4.22)) while being in a mental health HPSA was not associated with prescribing. There was no association with rural location and prescribing.

Table 1. Physician, Practice, and County Characteristics of Family Physicians Registering to Continue their American Board of Family Medicine Certification in 2017 and 2018 (n = 2726)

	N (%)
Prescribes Buprenorphine	161 (5.9)
Physician characteristics	
Male gender	1,556 (57.1)
Age ≥50 years	1,492 (54.7)
White race	1,972 (72.3)
Hispanic ethnicity	189 (6.9)
MD degree vs. DO degree	2,458 (90.2)
International medical graduate	600 (22.0)
Practice characteristics	
Practice organization	
Academic health center	186 (6.8)
Federally qualified health center	173 (6.3)
Federal	90 (3.3)
Health maintenance organization	173 (6.3)
Hospital owned	917 (33.6)
Miscellaneous/other	125 (4.6)
Other public	128 (4.7)
Private practice	934 (34.3)
Site size	
Solo practice	306 (11.2)
2 to 5 providers	938 (34.4)
6 to 20 providers	838 (30.7)
>20 providers	644 (23.6)
Any mental health professional	967 (35.5)
County characteristics	
Whole county health professional shortage area—mental health	519 (19.0)
Rural county	405 (14.9)

Discussion

Using a large representative sample of FPs, we found that only 6% prescribed buprenorphine but that practice in an FQHC, solo practice, or having collaborative mental health were positively correlated with prescribing. These findings indicate that

Table 2. Physician, Practice, and County Characteristics of Family Physicians Registering to Continue their American Board of Family Medicine Certification in 2017 and 2018 by Whether they Prescribe Buprenorphine (n = 2726)

	Prescribes Buprenorphine, N (%)	Does not Prescribe Buprenorphine, N (%)
Physician characteristics	n = 161	n = 2565
Gender		
Male	100 (6.4)	1456 (93.6)
Female	61 (5.2)	1109 (94.8)
Age		
Under 50	67 (5.4)	1167 (94.6)
50 or older	94 (6.3)	1398 (93.7)
Race		
White	113 (5.7)	1859 (94.3)
Non-White	48 (6.4)	706 (93.6)
Ethnicity		
Hispanic or Latino	13 (6.9)	176 (93.1)
Not Hispanic	148 (5.8)	2389 (94.2)
Degree type		
DO	13 (4.9)	255 (95.1)
MD	148 (6.0)	2310 (94.0)
International medical graduate		
Yes	35 (5.8)	565 (94.2)
No	126 (5.9)	1993 (94.1)
Practice characteristics		
Practice Organization*		
Academic Health Center	19 (10.2)	167 (89.8)
Federally qualified health center	27 (15.6)	146 (84.4)
Federal	2 (2.2)	88 (97.8)
Health maintenance organization	5 (2.9)	168 (97.1)
Hospital owned	31 (3.4)	886 (96.6)
Miscellaneous/other	9 (7.2)	116 (92.8)
Other public	8 (6.3)	120 (93.8)
Private practice	60 (6.4)	874 (93.6)
Site size		
Solo practice	28 (9.2)	278 (90.8)
2 to 5 providers	51 (5.4)	887 (94.6)
6 to 20 providers	42 (5.0)	796 (95.0)
>20 providers	40 (6.2)	604 (93.8)
Any mental health professional*		
Yes	84 (8.7)	883 (91.3)
No	77 (4.4)	1682 (95.6)
County characteristics		
Whole county health professional shortage area—mental health		
Yes	26 (5.0)	493 (95.0)
No	135 (6.1)	2072 (93.9)
Rurality		
Rural	26 (6.4)	379 (93.6)
Urban	135 (5.8)	2186 (94.2)

*P value for χ^2 test $< .05$.

Table 3. Percent of Family Physicians Prescribing Buprenorphine by Primary Practice Site Size and Rural/Urban Status in 2017 and 2018

Site size	Rural, N (%)	Urban, N (%)	Total, N (%)
Solo practice (n = 306)	7 (17.1)	21 (7.9)	28 (9.2)
2 to 5 providers (n = 938)	6 (3.3)	45 (6.0)	51 (5.4)
6 to 20 providers (n = 838)	9 (6.4)	33 (4.7)	42 (5.0)
>20 providers (n = 644)	4 (9.8)	36 (6.0)	40 (6.2)

Number and percent represent the percentage of family physicians in each size of practice who prescribe buprenorphine.

few FPs are prescribing buprenorphine but reinforces past work that those in practices with mental health resources, which includes FQHCs, are more likely prescribe.[6,14]

Prior work found that rural buprenorphine prescribers were less likely to be in solo practices.[7] We found that solo practice was positively and significantly associated with prescribing buprenorphine and that rural FPs in solo practice settings had the highest rates of prescribing. We suspected these FPs might hold additional certification in addiction medicine and may be running an addiction focused practice but, none held addiction certification. This finding, together with lack of association between mental health HPSA status and prescribing suggests that FPs in any practice setting can overcome access barriers to mental health care for their opioid use disorder (OUD) patients. However, past work documented a sharp decline in the colocation of primary care physicians with both psychologists and behavioral health clinicians with increasing rurality,[15] indicating a policy lever to support FPs treating OUD.

Table 4. Adjusted Associations between Personal, Practice, and County Characteristics with Family Physicians Prescribing Buprenorphine in 2017 and 2018

	Odds Ratio (95% CI)
Physician characteristics	
Male gender	1.39 (0.97, 1.97)
Age ≥50 years	1.03 (0.73, 1.46)
White race	0.82 (0.55, 1.22)
Hispanic ethnicity	1.18 (0.63, 2.22)
MD degree vs. DO degree	1.01 (0.55, 1.84)
International medical graduate	1.08 (0.69, 1.68)
Practice characteristics	
Practice organization	
Academic health center	1.29 (0.67, 2.48)
Federally qualified health center	1.98 (1.08, 3.63)
Federal	0.24 (0.05, 1.03)
Health maintenance organization	0.37 (0.14, 0.99)
Hospital owned	0.53 (0.33, 0.87)
Miscellaneous/other	0.97 (0.45, 2.08)
Private practice	Reference
Other public	0.84 (0.36, 1.93)
Site size	
Solo practice	2.60 (1.38, 4.92)
2 to 5 providers	1.48 (0.89, 2.45)
6 to 20 providers	0.90 (0.56, 1.44)
>20 providers	Reference
Any mental health professional	2.70 (1.73, 4.22)
County characteristics	
Health professional shortage area—mental health	0.72 (0.42, 1.23)
Rural County	1.28 (0.73, 2.23)

CI, confidence interval

Other reports of ABFM data found that the percent of graduating residents and early-career FPs who intend, or are, prescribing buprenorphine is higher than that of mid-to-late career FP's and is increasing.[13] These findings indicate that early career FPs may be more likely to prescribe as addiction medicine training is becoming more common in family medicine residencies[16] but, that other educational or practice changes will need to occur to induce FPs further from training to prescribe buprenorphine.

Our study is subject to limitations. First, our data are cross-sectional and we cannot infer causality. Second, we lacked data on how many patients FPs are treating and there may be differential associations for those treating 100, or more, patients. Third, despite a large overall sample size, with only 6% prescribing and 15% rural, we lacked power to run stratified analyses or test for interactions.

In conclusion, we found that few FPs prescribed buprenorphine but, those with practice settings and features supporting mental health services were more likely to prescribe. With training in the bio-

psychosocial model, and whole-person orientation, and a more even distribution with the population across the rural continuum, FPs are perfectly situated to meet increasing need for MAT. However, ensuring they have supporting mental health services may be central to more FPs providing MAT.

To see this article online, please go to: http://jabfm.org/content/33/1/118.full.

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