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Factors influencing the acceptance of referrals for clinical pharmacist managed disease states in primary care

Shubha Bhat [Ambulatory Care Outcomes Research Fellow],

Department of Clinical Pharmacy, University of Colorado Skaggs School of Pharmacy and Pharmaceutical Sciences, Aurora, CO

Miranda Kroehl [Biostatistician],

Department of Biostatistics and Informatics, Colorado School of Public Health, University of Colorado, Aurora, CO

Whitley M. Yi [Pharmacy Student],

Department of Clinical Pharmacy, University of Colorado Skaggs School of Pharmacy and Pharmaceutical Sciences, Aurora, CO

Jaclyn Jaeger [Pharmacy Student],

Department of Clinical Pharmacy, University of Colorado Skaggs School of Pharmacy and Pharmaceutical Sciences, Aurora, CO

Angela M. Thompson [Assistant Professor and Clinical Pharmacist],

Department of Clinical Pharmacy, University of Colorado Skaggs School of Pharmacy and Pharmaceutical Sciences, Aurora, CO

H. Mindy Lam [Assistant Professor and Primary Care Physician],

Department of Medicine, University of Colorado School of Medicine, Aurora, CO

Danielle Loeb [Assistant Professor and Primary Care Physician],

Department of Medicine, University of Colorado School of Medicine, Aurora, CO

Katy E. Trinkley* [Associate Professor and Clinical Pharmacist]

Department of Clinical Pharmacy, University of Colorado Skaggs School of Pharmacy and Pharmaceutical Sciences, Aurora, CO

Abstract

Objective: Clinical pharmacists use population health methods to generate chronic disease management referrals for patients with uncontrolled chronic conditions. The purpose of this study was to compare primary care providers' (PCPs) referral responses for 4 pharmacist-managed indications and to identify provider and patient characteristics that are predictive of PCP response.

Design: Retrospective cohort study.

Setting: This study occurred in an academic internal medicine clinic.

* **Correspondence:** Katy E. Trinkley, PharmD, Associate Professor, Mail Stop C 238, 12850 E. Montview Blvd., Aurora, CO 80045. Katy.trinkley@ucdenver.edu (K.E. Trinkley).

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Participants: Clinical pharmacy referrals generated through a population health approach between 2012 and 2016 for hypertension, chronic pain, depression, and benzodiazepine management were included.

Main outcome measures: Proportion of referrals accepted, left pending, or rejected and influencing provider and patient characteristics.

Results: Of 1769 referrals generated, PCPs accepted 869 (49%), left pending 300 (17%), and rejected 600 (34%). Compared with referrals for hypertension, benzodiazepine management, and depression, chronic pain referrals had the lowest likelihood of rejection (odds ratio [OR] 0.31; 95% CI 0.19–0.49). Depression referrals had an equal likelihood of being accepted or rejected (OR 1.04; 95% CI 0.66–1.64). Provider characteristics were not significantly associated with referral response, but residents were more likely to accept referrals. Patient characteristics associated with lower referral rejection included black race (OR 0.39; 95% CI 0.18–0.87), higher systolic blood pressure (OR 0.98; 95% CI 0.97–0.99), and missed visits (OR 0.24; 95% CI 0.07–0.81).

Conclusion: The majority of referrals for clinical pharmacists in primary care settings were responded to, varying mostly between acceptance and rejection. There was variability in referral acceptance across indications, and some patient characteristics were associated with increased referral acceptance.

Background

Population health management is the process of identifying select patients and delivering targeted interventions to these patients to optimize their well-being, minimize negative outcomes, and reduce health care costs.^{1–3} Many providers, including clinical pharmacists, are participating in population health management in a variety of ways.^{1,4} One population health approach used by clinical pharmacists consists of identifying patients with uncontrolled chronic conditions who would best benefit from medication management. For the identified patients, clinical pharmacists can generate and forward referrals to the patients' primary care provider (PCP) for approval of chronic disease management. Once approval is obtained, patients are proactively contacted for medication management until chronic disease control is achieved.⁵ Although this particular population health approach often requires pharmacists to be practicing under a collaborative practice agreement (CPA), pharmacists integrated in team-based care and practicing without a CPA can use a modified population health approach by informing providers of patients who frequently access the health care system and providing patient-specific recommendations to optimize these patients' health.⁶

Prior studies have shown the inclusion of pharmacists in primary care settings improves the use of evidence-based therapies and patient outcomes for many chronic diseases; regardless, PCPs' acceptance of chronic disease management by clinical pharmacists varies widely.^{7–11} Possible explanations for this variation have been hypothesized previously and include lack of understanding or discomfort with clinical pharmacists' abilities or scope of practice, belief that pharmacists' roles are limited to tasks such as compounding and dispensing of medications, perception that patients may be too medically complex for pharmacists to

manage, and concern for fragmented care with multiple providers being involved in a patient's care.^{12–19} Although these reasons can influence providers' engagement with clinical pharmacy services and affect acceptance of chronic disease management referrals, it is unknown whether there are provider and patient characteristics that predict a PCP's response to clinical pharmacy referrals. For example, the time a PCP spends providing clinical care for patients relative to other responsibilities or the complexity of a patient's comorbidities can influence whether PCPs are willing to involve clinical pharmacists in their patients' care. Identification of such characteristics is essential to refining population health approaches to maximize efficiency and effectiveness. In addition, understanding barriers to providers' acceptance of clinical pharmacy referrals can guide targeted interventions to increase provider support and utilization of clinical pharmacy services.

Objectives

We conducted an observational retrospective cohort study to compare PCP referral responses across 4 pharmacist-managed indications and to determine whether specific provider and patient characteristics influence PCP referral response. This study was approved by the Colorado Multiple Institutional Review Board.

Methods

Practice setting and population health approach

This study took place at an academic internal medicine clinic. The clinic consists of 99 PCPs (i.e., medical residents, advanced practice practitioners, attending physicians) and serves an estimated 26,000 unique patients with more than 50,000 annual patient visits. The patient population is predominantly white, has commercial insurance, and has a high prevalence of chronic conditions.

Clinical pharmacists have been embedded in the internal medicine clinic since 2011 and practice under CPAs for hypertension, chronic pain, depression, and benzodiazepine management. With input from the clinic, these 4 disease states were considered the highest priority areas that warranted clinical pharmacist involvement and services are now well-established. The intent of the hypertension, chronic pain, and depression services is to achieve disease control and optimize medication management. The intent of the benzodiazepine service is to assist with benzodiazepine taper or discontinuation and to optimize treatment for generalized anxiety disorder, sleep disturbance, and panic disorder with safer and preferred agents. Under CPAs, clinical pharmacists see patients independently and are permitted to make medication changes, order prescriptions under the PCP's name, and obtain necessary laboratory tests for monitoring of medications and disease-specific outcomes.

In addition, clinical pharmacists provide support in other clinical activities, such as participating in daily huddle for patients with uncontrolled hypertension, answering drug information questions, seeing patients along with the providers when requested, and establishing new services, such as diabetes management. These activities permit the clinical

pharmacists to be well integrated in the clinic and to establish varying relationships with every provider, despite the clinic being staffed by a large number of providers.

The current population health approach used by the clinical pharmacists involves review of disease-specific registries built in the electronic health record (EHR) and use of predefined criteria to identify patients with uncontrolled chronic conditions (e.g., blood pressure > 140/90 mm Hg for hypertension; Patient Health Questionnaire [PHQ-9] score of 9 or more for depression; active, long-term prescriptions for opioids or benzodiazepines). For the identified patients, referrals for hypertension, chronic pain, depression, or benzodiazepine management are generated within the EHR and forwarded to the patients' PCP for acceptance or rejection of clinical pharmacy management. Alternatively, PCPs can leave referrals pending indefinitely as our EHR system does not mandate a response. For accepted referrals, patients are contacted and invited to schedule a visit with the clinical pharmacist.

Data collection and measured outcomes

All clinical pharmacy referrals for hypertension, chronic pain, depression, and benzodiazepine management generated within the EHR through the population health approach between 2012 and 2016 for patients age 18 years or older who received primary care services in the academic internal medicine clinic were included. PCP response to each referral was collected and categorized as accepted, rejected, or pending. Referrals with no response (i.e., not accepted or rejected) within 3 months of being generated were considered pending. Of note, referrals for the same patient that were generated multiple times for the same disease-specific indication or for several disease-specific indications were also included.

We also investigated whether associations existed between provider and patient characteristics and PCP referral response by randomly selecting 248 unique patients with referrals based on a sample size calculation. Provider characteristics assessed included time in practice since completion of terminal training, current position (medical resident, advanced practice practitioner such as advanced practice nurses, or attending), duration employed by internal medicine clinic, sex, time spent in the clinic per week, and whether the provider responding to the referral was the patient's PCP. All provider data were collected from the providers' public profile available on the institution's website and the EHR. Patient characteristics collected included demographics (e.g., age, sex, race, ethnicity), potential indicators of patient complexity, and nonadherence. ZIP code was collected and quantified using Internal Revenue Service data as an indicator of socioeconomic status. Patient complexity characteristics were identified according to investigators' clinical experience, including presence of a specialist referral within 6 months of generated clinical pharmacy referrals, number of mental health diagnoses, presence of controlled substance prescriptions, Charlson Comorbidity Index, and disease state assessment (e.g., PHQ-9 score for depression, atherosclerotic disease risk score, systolic and diastolic blood pressure measurements, and morphine dose equivalence of currently prescribed opioids). Nonadherence was categorized by the documentation of any of the following in the EHR: missed, canceled, or no-show appointments; mention of medication nonadherence in providers' notes; documentation of nonadherence to provider's recommendations; and

failure to follow up with specialist referrals. All patient characteristics were collected from the EHR.

Statistical analyses

Descriptive statistics were used to characterize referral response for all referrals and by indication. To determine whether referral rejection differed by indication, logistic regression accounting for within-physician correlation was used to estimate the odds of referral rejection compared with acceptance by disease state. An odds of 1 indicated a 50% chance of rejection. To evaluate provider characteristics, providers with 5 or more referrals were included to generate meaningful analyses and to capture the characteristics of PCPs frequently interacting with clinical pharmacy referrals. Negative binomial regression was used to determine provider characteristics associated with referral rejection. Logistic regression was used to identify which patient characteristics influenced referral rejection. Certain patient factors were also considered to influence indication-specific referrals and were analyzed within indication-specific cohorts (e.g., systolic and diastolic readings for hypertension). SAS 9.4 (SAS Institute Inc., Cary, NC) was used for analyses.

Results

Between 2012 and 2016, 1769 referrals were generated for 1216 unique patients and forwarded to 78 unique PCPs for 4 pharmacist-managed chronic indications. Of these referrals, 869 (49%) were accepted, 300 (17%) were left pending, and 600 (34%) were rejected. The median total number of referrals generated per PCP was 4 (interquartile range, 2–25), reflecting a diverse provider population (e.g., some providers had small patient panels). The median rejection rate by PCP was 31.2% (interquartile range, 0%–50%). Table 1 outlines referral response and odds of referral rejection by indication. Compared with referrals for other disease states, referrals for chronic pain were less likely to be rejected. Using pain referrals as a reference group, depression referrals were 3-fold more likely to be rejected (OR 3.31; 95% CI 2.04–5.38), whereas benzodiazepine (OR 2.14; 95% CI 1.37–3.35) and hypertension (OR 1.95; 95% CI 1.34–2.83) referrals were 2-fold more likely to be rejected. The odds of rejecting a depression referral was 1.04, indicating an equal likelihood of referral rejection and acceptance.

To determine provider and patient characteristics associated with referral response, all the referrals collected were randomized in Microsoft Excel, and the first 248 referrals for unique patients, per a calculated sample size, were selected. This cohort of referrals consisted of 41 unique providers who were forwarded to 1 or more clinical pharmacy referrals. Of these providers, 10 were forwarded fewer than 5 referrals and excluded from the analysis. All referrals forwarded to 31 providers ($n = 1644$ referrals; average of 53 ± 43.2 referrals per provider) were considered for the evaluation of provider characteristics and referral rejection. Provider characteristics associated with referral rejection are presented in Table 2. Although provider characteristics studied were not significantly associated with rejection rate, a trend in lower rejection rate was noted with residents compared to attendings ($P = 0.06$).

Patient characteristics associated with rejected referrals for the full cohort of patients (n = 248) are presented in Table 3. Compared with white patients, black patients were less likely to have their referrals rejected (OR 0.30; 95% CI 0.18–0.87). Patients with higher systolic blood pressure (OR 0.98; 95% CI 0.97–0.99) or greater number of missed visits (OR 0.24; 95% CI 0.07–0.81) were also less likely to have their referrals rejected. Of note, 100% of the referrals (n = 19) responded to by a covering PCP (i.e., not the patient's designated PCP) were accepted. None of the other patient characteristics, including Charlson Comorbidity Index or number of medications, were found to be significant predictors of referral response.

Patient characteristics evaluated for indication-specific referrals are also presented in Table 2. Patients with a higher PHQ-9 score were less likely to have their depression referral rejected (OR 0.80; 95% CI 0.65–0.99). Patients with chronic albuminuria (n = 8) or a prior cardiology or nephrology referral (n = 6) all had their hypertension referrals accepted. Patients with a generated referral for benzodiazepine management were not found to have prior psychology or psychiatry referrals. None of the patient characteristics assessed specifically for pain referrals were not found to be predictive of referral rejection.

Discussion

PCPs accepted approximately half of clinical pharmacy referrals generated through a population health approach. The variation in referral response can be attributed to the culture of the practice setting and providers' expectation of clinical pharmacists. For example, despite clinical pharmacists having established relationships with all the providers, clinical pharmacists knew some providers better than others, which could potentially influence referral response and shape providers' expectation of clinical pharmacists' roles. In one study that assessed indications for 137 clinical pharmacy referrals proactively placed by PCPs, only 19 (13.9%) were placed for disease-specific management. The majority of referrals were placed for general medication review.²⁰ Thus, depending on the provider-pharmacist relationship and practice setting, some providers place a higher value or perceive a greater need for the other services clinical pharmacists provide (e.g., review of patients' medication regimens, assessment of drug interactions, assistance with adverse effect management, or optimization of adherence) over focused management for specific chronic diseases. Alternatively, the providers who value pharmacists assisting with focused disease management can be influenced to either accept or reject clinical pharmacy services because of additional factors such as patient complexity and personal comfort with disease management. In our study, the odds of nearly 1 for Charlson Comorbidity Index may represent dichotomous actions, in that 50% of providers are willing to refer complex patients whereas 50% remain hesitant to accept clinical pharmacy referrals for complex patients. Additional studies to understand providers' thought processes with acceptance of clinical pharmacy referrals and services for specific cohorts of patients are needed.

We found that PCPs' responses to indication-specific referrals varied greatly. In general, chronic pain, hypertension, and benzodiazepine referrals were more likely to be accepted, whereas referrals for depression had an equal likelihood of being accepted or rejected. Prior studies assessing referral response to clinical pharmacy services for hypertension, chronic pain, and benzodiazepine management report similar findings of variable responses.^{9,10,21}

Providers were most likely to accept chronic pain referrals because of discomfort with management and increased willingness to have others assist with management, given current stigmas and challenges with assessing disease control.^{22,23} Some providers might also perceive depression similarly. Although management of chronic pain and depression is less commonly addressed by clinical pharmacists in general, our study shows that these 2 services might be valued by providers, given the complex and high-risk medications involved. Overall, although we did not ascertain PCP reasons for each referral response, our study reaffirms the variability in the use of clinical pharmacy services for specific chronic diseases in primary care.

We identified specific provider and patient characteristics to be predictive of PCPs' responses to referrals. Residents were noted to have a trend toward fewer referral rejections when compared with attendings, although this was not statistically significant, possibly because residents tend to be more receptive to team-based care and interprofessional collaboration, given the significant exposure to these elements during their residency.²⁴ Regarding patient characteristics, black race, higher systolic blood pressure, and greater number of missed visits were found to be associated with lower rejection of referrals. PCPs may be less likely to reject referrals for black patients for 2 reasons: (1) this population is more comfortable with nonphysician providers and might express increased receptiveness toward pharmacy services and (2) PCPs, despite their best intention to provide equal treatment to all patients, might experience implicit bias or perceive black patients to have more health disparities, thereby believing that additional services are warranted.^{25,26} Regarding systolic blood pressure, the study investigators hypothesize that these patients are more refractory to attempts to control their blood pressure or are taking more medications; therefore, they are perceived by their PCP to be in greater need of a clinical pharmacist's expertise and interventions. For missed visits, it is likely PCPs viewed clinical pharmacy services as an additional resource to re-engage patients and get them back into the health care system.

The characteristics assessed in this study were specifically selected to mirror reasons for refusal of clinical pharmacy services provided in the literature. The most common reasons for PCP refusal of hypertension referrals reported included PCP preference to manage condition themselves, belief that blood pressure was already controlled, and belief that patients were too complex for pharmacist management.⁹ Although that study focused on hypertension, we applied these findings to our study and evaluated these characteristics for other disease states. As a surrogate marker to gauge PCPs' desire to manage conditions by themselves, we assessed for the presence of specialist referrals. Given that PCPs might perceive their patients' disease to be controlled, we collected all disease-specific parameters when available to assess disease control and appropriateness of treatment (e.g., morphine dose equivalence for pain and blood pressure measurements for hypertension). Lastly, the study investigators collected numerous characteristics as surrogate markers for patient complexity, including medication allergies, number of medications prescribed, and Charlson Comorbidity Index.

Despite evaluating many variables, few provider or patient characteristics were found to be associated with PCP referral response. This finding might be explained in part by patient and

provider heterogeneity, which could be addressed with a larger sample of data. In addition, it is difficult to capture providers' perception and inherent knowledge of individual patients objectively through chart review or publicly available data. One prior study assessing provider perception of medical complexity found provider perceptions often did not correlate with three commonly used comorbidity algorithms, demonstrating the challenges of capturing providers' perception of patients.²⁷ Furthermore, we hypothesize some PCPs do not review each patient's characteristic individually; rather, they briefly review the patient's chart and use their own composite criteria to determine if patients are appropriate for chronic disease management by the clinical pharmacist. Alternatively, PCPs might not even review the patient's chart and instead rely on their impression of the patient, based on recall.

In addition to the limitations listed here, this study was limited by its retrospective nature and inclusion of one internal medicine clinic. The study investigators attempted to collect data for additional characteristics, such as Generalized Anxiety Disorder and Insomnia Severity Index scores but were unable to do so because of limited availability or documentation of data. The investigators also considered collecting provider age but determined that years in practice would be a better predictor because it correlated to patient care experiences, which might have included potential exposure to pharmacy services. Despite these limitations, this study demonstrates that PCP responses to clinical pharmacist management of chronic diseases varies, and the reasons for this variability might not be captured easily through chart review. Additional studies are warranted for in-depth insights into provider and patient characteristics influencing referral response.

The study investigators recognize that pharmacy practice and CPA utilization varies across the country. Although some details in this study were site specific, certain study findings can still be applied to advance clinical pharmacy services, irrespective of practice setting. For example, clinical pharmacists looking to obtain provider acceptance could consider offering services or assistance with conditions that providers are not fully comfortable managing, such as chronic pain and depression. In addition, although nearly half of the referrals were left pending or rejected in our study, this does not necessarily indicate that pharmacy services are devalued; instead, the approach of generating referrals to providers through the EHR might not be ideal, as provider burnout with other administrative tasks within the EHR may be leading to referral ignorance or rejections. Thus, pharmacists working with a referral-based system to build patient panels could consider alternative methods of obtaining referral acceptance, such as generating a list of identified patients and having providers approve that list in person on a regular basis to obtain higher referral acceptance. We are currently exploring this process. Lastly, this study highlights that providers' thought processes regarding the acceptance of clinical pharmacy services for their patients varies. The best approach to identifying influential factors of referral response or in general the use of clinical pharmacy services may be to speak with providers individually or through focus groups.

Conclusion

Approximately half of clinical pharmacist referrals generated in a primary care setting were accepted, and variability in referrals for different indications was noted. Although provider

characteristics were not statistically significant, a trend was noted with residents having lower referral rejection rates when compared with attendings. Patient characteristics associated with lower referral rejection rates include black race, higher systolic blood pressure, and greater number of missed visits. Additional studies are warranted for further understanding of specific provider and patient characteristics that influence PCP response to clinical pharmacy referrals.

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Key Points

Background:

- Clinical pharmacists are using population health methods to generate chronic disease management referrals for patients with uncontrolled chronic conditions.
- Primary care providers' (PCPs) acceptance of chronic disease management by clinical pharmacists varies widely; however, it is not known whether provider or patient characteristics predict PCP response to clinical pharmacy referrals.
- Identification of such characteristics is essential to refining population health care approaches to maximize efficiency and effectiveness and to permit for targeted interventions.

Findings:

- Clinical pharmacist referrals for chronic pain management are least likely to be rejected, when compared with referrals for hypertension, benzodiazepines and depression.
- Primary care providers are more likely to accept clinical pharmacy referrals for patients who are black, have higher systolic blood pressure, or have a higher number of missed visits.

Table 1

Referral response and odds of referral rejection by indication

Referral response	Benzodiazepine	Depression	Hypertension	Chronic pain	Total
Total, n	327	171	991	280	1769
Accepted, n (%)	124 (38)	76 (45)	491 (50)	178 (63)	869 (49)
Pending, n (%)	102 (31)	9 (5)	142 (14)	47 (17)	300 (17)
Rejected, n (%)	101 (31)	86 (50)	358 (36)	55 (20)	600 (34)
Odds of rejection (compared to acceptance), OR (95% CI)	0.67 (0.43–1.04)	1.04 (0.66–1.64)	0.61 (0.43–0.86)	0.31 (0.19–0.49)	–

Abbreviation used: OR, odds ratio.

Table 2

Provider characteristics (n = 31) and referral rejection

Characteristics	Rate ratio	95% confidence interval	P value
Position			
APP vs. Attending	0.96	0.62–1.48	0.85
Residents vs. Attending	0.55	0.29–1.03	0.06
Time in clinic; FTE (R > 0.75)			
< 0.25	0.85	0.55–1.29	0.44
0.25–0.50	0.76	0.51–1.13	0.69
0.51–0.75	0.91	0.58–1.44	0.44
Female sex	0.84	0.60–1.17	0.30
Time since terminal training ^a	1.00	0.99–1.02	0.56
Time employed at internal medicine clinic ^b	1.01	0.99–1.02	0.54

Abbreviations used: APP, advanced practice practitioner; FTE, full-time equivalent; R, reference.

^aRange of 5–40 years.^bRange of 0–39 years.

Table 3

Patient characteristics (n = 248) and referral rejection

Characteristics	Odds ratio	95% confidence interval	P value
Age	1.00	0.98–1.02	0.99
Female sex	0.89	0.49–1.61	0.69
Race (R: white)			
Black	0.39	0.18–0.87	0.02
Other	1.05	0.51–2.18	0.89
Hispanic	0.77	0.33–1.82	0.54
Household income by ZIP code (R > \$75,000/year)			
\$1000–25,000/year	0.44	0.10–2.00	0.28
\$26,000–\$50,000/year	0.56	0.20–1.62	0.28
\$51,000–\$75,000/year	0.69	0.22–2.20	0.52
Insurance (R: commercial)			
Medicare or Medicaid	0.54	0.28–1.03	0.06
Other	0.68	0.26–1.74	0.41
Number of medications ^a	0.98	0.93–1.03	0.35
Using over-the-counter medications	1.01	0.56–1.80	0.97
Using herbal supplements	0.76	0.38–1.53	0.44
Has medication allergies	1.23	0.70–2.18	0.46
Taking opioid	0.63	0.33–1.19	0.15
Taking other controlled substance	1.13	0.55–2.31	0.73
Taking benzodiazepine	1.14	0.56–2.33	0.71
Charlson Comorbidity Index	0.98	0.86–1.13	0.82
Systolic blood pressure value	0.98	0.97–0.99	0.01
Diastolic blood pressure value	0.99	0.96–1.01	0.18
eGFR (R: 90)			
60–89	0.75	0.40–1.39	0.35
< 60	1.12	0.42–2.97	0.81
Number of mental health diagnoses	1.04	0.79–1.38	0.77
Has incomplete referrals	0.56	0.28–1.15	0.11

Characteristics	Odds ratio	95% confidence interval	P value
Has missed visits	0.24	0.07–0.81	0.02
Hypertension Referrals (n = 170)			
Atherosclerotic Cardiovascular Disease score	0.98	0.94–1.04	0.54
Depression Referrals (n = 34)			
Patient Health Questionnaire (PHQ)-9 score	0.80	0.65–0.99	0.04
Has psychology referral	3.12	0.21–45.36	0.37
Has psychiatry referral	0.37	0.05–2.64	0.29
Pain Referrals (n = 43)			
Has pain specialist referral	0.42	0.03–5.94	0.49
Total morphine equivalence ^b	1.00	0.98–1.01	0.66

Abbreviations used: R, reference; eGFR, estimated glomerular filtration rate.

^aRange of 0–29 medications.

^bRange of 7.5–600 total morphine equivalence.