ORIGINAL RESEARCH

Satisfaction with Health Care Among Prescription Opioid Recipients

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Background: **Prior studies examining the association of opioid prescriptions with satisfaction with care involved limited, selected samples with mixed findings. We examined this issue, of relevance to reducing discretionary opioid prescribing, in a US representative sample.**

Methods: **We performed an observational study of adults (N = 69,985) enrolled in the 2005 to 2015 US Medical Expenditure Panel Surveys. We examined the association of high (top quartile) satisfaction with receipt of 0, 1 to 5, or ≥6 opioid prescriptions per year. The base model adjusted for demographics and year; the full model added adjustment for health status (12-item Short Form Survey). A sensitivity analysis further adjusted for outpatient visits.**

Results: **In the base model, respondents who received 1 to 5 or ≥6 opioid prescriptions were each less likely to have high satisfaction than those who received no opioid prescriptions (adjusted odds ratios [AORs] [95% CIs] 0.83 [0.79–0.88] and 0.70 [0.63–0.79], respectively). After adding health status adjustment, compared with respondents receiving no opioid prescriptions, those receiving 1 to 5 were similarly likely and those reporting ≥6 were more likely to have high satisfaction (AORs [95% CIs] 1.00 [0.94–1.06] and 1.44 [1.27–1.63], respectively). The findings were not substantively affected by further adjustment for outpatient visits.**

Discussion: **In a US national sample, individuals who received ≥6 opioid prescriptions in a year were more likely to have top quartile satisfaction than those receiving fewer or no opioid prescriptions after accounting for health status. Whether the high satisfaction among such individuals was driven by the prescriptions themselves or by other personal characteristics requires study, as do the effects of deprescribing. (J Am Board Fam Med 2020;33:34–41.)**

Keywords: **Cohort Studies, Health Status, Health Surveys, Opioids, Outpatients, Pain, Patient Satisfaction, Prescriptions.**

Amid ongoing concerns that US clinicians overprescribe opioid medications, there has been an increasing focus on identifying potential drivers of discretionary prescribing to help inform targeted interventions aimed at mitigating the problem.[1–3] Among other potential drivers, it has been postulated that the practice of using patient satisfaction scores to incentivize clinicians may contribute to the problem of discretionary opioid prescribing.[4] That is, in the context of time-pressured outpatient office visits, with an imperative to maintain clinical productivity (eg, high patient "throughput,") and increasingly strong societal and individual patient expectations for immediate relief of pain, financially incentivizing clinicians for maintaining high patient satisfaction may contribute to discretionary prescribing of opioid medications.[5,6]

Prior research has provided mixed, indirect support for this notion. In various studies, US clinicians have noted the perception that financial incentives for maintaining high patient satisfaction may at times contribute to discretionary opioid prescribing.[7,8] In 2 studies of patients, both of which focused on selected samples of adults with

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musculoskeletal conditions, those who received prescription opioids were more satisfied with their health care than those receiving no prescription opioids after adjusting for potential confounders.[9,10] However, a third patient study found that the patients of primary care clinicians with relatively high rates of opioid prescribing were no more satisfied with their pain management than patients of providers with lower rates of prescribing.[11] One study of adult outpatients visiting a single primary care office found that, after adjusting for potential confounders, clinician denial of requests for pain medication was associated with worse patient satisfaction compared with fulfillment of pain medication requests.[12]

To our knowledge, no studies of large samples of adults who are representative of the US population as a whole have examined how receipt of opioid prescriptions is associated with patient satisfaction with care. Such studies could offer additional insights to clinicians, patients, health systems, and policy makers regarding a potential driver of discretionary opioid prescribing and further inform the ongoing professional and public dialog regarding potential beneficial versus detrimental impacts of opioid deprescribing efforts.[13,14] We used data from individuals enrolled in the 2005 to 2015 US Medical Expenditure Panel Survey (MEPS) to examine the association of receipt of opioid prescriptions with high (top quartile) patient satisfaction with care.

Methods

The MEPS is a set of large-scale surveys of families and individuals, their medical providers, and employers across the United States, focused specifically on the civilian and noninstitutionalized population.[15] The surveys are conducted by the Agency for Health care Research and Quality as a subset of the National Health Interview Survey and use an overlapping panel design.[16] One element of MEPS, the Household Component (HC), collects sociodemographic information.[17] Another element, self-administered and supplemental to the HC, includes items on satisfaction with health care during the preceding 12 months and health status.[17] Still another MEPS element is the Prescribed Medicines file, which includes information on prescription opioids. We utilized data for the years 2005 to 2015 from the MEPS elements, which have been used previously in hundreds of published statistical briefs and research studies.[18] Annual response rates declined from 61.3% to 47.7% during the study period.[19]

The analytic sample for this study included all participants aged 18 or older for whom opioid prescription, satisfaction with care, and health status data were available. Ethical approval for the study was provided by the University of California Davis Institutional Review Board (exempted status).

Main Measures

The study measure of satisfaction with care was a standardized 5-item scale, used previously,[20] constructed from questions in the Consumer Assessment of Health Plans Survey, which are included in the supplement to the MEPS HC.[21] The items asked about respondent satisfaction with the care they received from all health care providers (combined) during the preceding 12 months. Four of the items pertained to provider communication (asking how often in the past year the respondents' physicians or other providers listened carefully, explained things in a way that was easy to understand, showed respect for what they had to say, and spent enough time with them). The fifth item asked respondents to rate the health care they received from all providers over the past year from 0 (worst) to 10 (best). Cronbach's α for the scale in this sample was 0.88. Patients were characterized by quartile of satisfaction with providers because of the skewed distribution of satisfaction.

The following three categories of opioid prescription receipt were examined using data from the MEPS Prescribed Medicines file: no prescriptions received in the participation year, 1 to 5 prescriptions received in the year, and 6 or more prescriptions received in the year. The last category was chosen as a credible proxy for long-term opioid therapy, for which no unequivocal, broadly accepted definition exists. Support for the characterization of $\geq$6 prescriptions per year as indicating long-term use of opioids comes from the following findings. In the MEPS years we examined, 63% of those reporting $\geq$6 prescriptions in year 1 also reported $\geq$6 prescriptions in year 2, whereas only 33% of those reporting 1 to 5 prescriptions in year 1 reported any opioid prescriptions in year 2 (7% reported $\geq$6 prescriptions). Furthermore, only 7%

of those reporting no opioid prescriptions in year 1 reported ≥1 opioid prescriptions in year 2.

Covariates

Sociodemographic covariates included age (in years), sex, self-reported race/ethnicity (non-Hispanic white, Hispanic [any race], non-Hispanic black, and non-Hispanic other), education level (less than high school, some high school, high school graduate, some college, and college graduate), household income level as a percentage of the Federal Poverty Level (<100%, 100%–124%, 125%–199%, 200%–399%, or ≥400%), US Census region (Northeast, Midwest, South, or West), and health insurance status (uninsured, privately insured, or publicly insured). The study measure of health status, included in the supplement to the MEPS-HC, was the extensively validated 12-item Short-Form Health Survey (SF-12), which has been used widely in clinical and health services research for over 20 years, including in studies regarding pain and/or opioid use.[22–26] The SF-12 has specifically been shown to capture the impacts of both physical and mental health conditions on health status[23–28] and yields both a Physical Component Summary (PCS-12) score and a Mental Component Summary (MCS-12) score.[29] Although it is not a pain measure per se, the PCS-12 includes an item assessing the degree of pain-related functional impairment during the preceding month. Other items contributing to the PCS-12 score ask about the degree of perceived limitation in being able to pursue various daily activities or roles attributed to physical health issues. Parallel items contributing to the MCS-12 score assess perceived limitations in role function or activities attributed to emotional problems. Both the PCS-12 and MCS-12 scores range from 0 to 100, with higher scores indicating better health. To capture the influence of health care utilization, a potential marker for morbidity and propensity to seek care (both of which could, in turn, affect opioid prescribing and satisfaction with care), the study also used data from the MEPS regarding the number of outpatient physician office visits.

Analyses

The study data were analyzed using Stata version 15.1 (StataCorp, College Station, TX). The regression analyses utilized longitudinal strata and primary sampling unit identifiers with survey weights to account for the complex survey design of successive waves of the MEPS. However, reported descriptive statistics refer to the study sample and were not adjusted for survey design.

Two logistic regression analyses were conducted to model the association between opioid prescriptions received in the participation year (1 to 5 prescriptions or ≥6 prescriptions [long-term opioid therapy], vs none [the key independent variable]) and top quartile satisfaction with care delivered by all providers (combined) during the year (the dependent variable). The first (base) model was adjusted only for MEPS participation year (to account for any secular trends) and sociodemographics (age, sex, race/ethnicity category, education level, household income level as a percentage of the Federal Poverty Level, US Census region, and health insurance status). The second (full) model added adjustment for health status (PCS-12 and MCS-12 scores) to the base model. To explore the potential influence of health care utilization on the findings, a sensitivity analysis added an adjustment for the total number of outpatient office visits (all physicians) during the participation year to the full model.

The logistic regression analyses yielded adjusted odds ratios (AORs), the meaning of which can be difficult to interpret. Thus, to facilitate interpretation, we also report the findings as average marginal effects (the adjusted prevalence of top quartile satisfaction associated with each prescription opioid receipt category).

Results

The analytic sample included 69,985 adult MEPS participants between the years 2005 to 2015 with complete opioid prescription, satisfaction with care, and health status data available. Compared with respondents who had lower levels of satisfaction with care, those with top quartile satisfaction were older and had better physical and mental health status (Table 1). In addition, higher proportions of respondents with top quartile satisfaction were female, non-Hispanic white, lived in the South or Midwest, and had private health insurance, whereas a lower proportion had attended or graduated college. Approximately 82% of respondents reported no opioid prescriptions, and most of those reporting opioid prescriptions had 1 to 5 prescriptions. Fewer respondents with top quartile satisfaction received opioid prescriptions than did respondents in other satisfaction quartiles (Table 1).

Table 1. Characteristics of the Study Participants, by Satisfaction with Care Level and Overall*

Characteristic	Top Quartile Satisfaction (N = 17,519)	Other Satisfaction Quartiles (N = 52,466)	*P* Value	Total (N = 69,985)
Age, mean (SD)	51.8 (18.1)	47.7 (17.5)	<.001	48.7 (17.7)
Female sex, no. (%)	10,833 (61.8)	31,320 (59.7)	<.001	42,153 (60.2)
Race/ethnicity category, no. (%)			<.001	
Non-Hispanic white	9,841 (56.2)	27,531 (52.5)		37,372 (53.4)
Hispanic (any race)	3,090 (17.6)	10,824 (20.6)		13,914 (19.9)
Non-Hispanic black	3,474 (19.8)	9,449 (18.0)		12,923 (18.5)
Non-Hispanic other	1,114 (6.4)	4,662 (8.9)		5,776 (8.3)
Education level, no. (%)			<.001	
Less than high school	1,375 (7.8)	4,085 (7.8)		5,460 (7.8)
Some high school	2,081 (11.9)	6,080 (11.6)		8,161 (11.7)
High school graduate	5,318 (30.4)	15,136 (28.8)		20,454 (29.2)
Some college	4,357 (24.9)	12,944 (24.7)		17,301 (24.7)
College graduate	4,388 (25.0)	14,221 (27.1)		18,609 (26.6)
Income as % of FPL, no. (%)			<.001	
<100	2,629 (15.0)	8,803 (16.8)		11,432 (16.3)
100 to 124	904 (5.2)	2,979 (5.7)		3,883 (5.5)
125 to 199	2,532 (14.5)	7,780 (14.8)		10,312 (14.7)
200 to 399	5,213 (29.8)	15,441 (29.4)		20,654 (29.5)
>400	6,241 (35.6)	17,463 (33.3)		23,704 (33.9)
United States Census region, no. (%)			<.001	
Northeast	2,921 (16.7)	8,768 (16.7)		11,689 (16.7)
Midwest	3,900 (22.3)	10,906 (20.8)		14,806 (21.2)
South	6,875 (39.2)	19,195 (36.6)		26,070 (37.3)
West	3,823 (21.8)	13,597 (25.9)		17,420 (24.9)
Health insurance type, no. (%)			<.001	
Any private	11,618 (66.3)	33,484 (63.8)		45,102 (64.4)
Only public	4,631 (26.4)	12,829 (24.5)		17,460 (24.9)
Uninsured	1,270 (7.2)	6,153 (11.7)		7,423 (10.6)
Health status, mean (SD)				
PCS-12 score	48.2 (11.6)	46.9 (11.6)	<.001	47.2 (11.6)
MCS-12 score	52.8 (9.8)	48.8 (10.6)	<.001	49.8 (10.5)
Office visits, mean (SD)	4.8 (6.5)	4.7 (7.0)	.10	4.7 (6.9)
Opioid prescriptions, no. (%)			<.001	
None	14,523 (82.9)	42,730 (81.4)		57,253 (81.8)
1 to 5	2378 (13.6)	7,607 (14.5)		9,985 (14.3)
>6	618 (3.5)	2,129 (4.1)		2,747 (3.9)

*Data are sample-based and were not adjusted for survey characteristics. FPL, Federal Poverty Level; MCS-12, SF-12 Mental Component Summary score; PCS-12, SF-12 Physical Component Summary score; SD, standard deviation.

The base model adjusted for sociodemographic characteristics and MEPS panel year revealed that compared with respondents who received no opioid prescriptions, those who received 1 to 5 or ≥6 prescriptions had lower odds of having top quartile satisfaction (Table 2). The corresponding average adjusted proportions with top quartile satisfaction were 26.1% (95% CI, 25.6%–26.7%), 22.9% (95% CI, 22.0%–23.8%), and 20.0% (95% CI, 18.2%–21.9%) for the 0, 1 to 5, and ≥6 opioid prescription categories, respectively. Other characteristics associated with lower adjusted odds of top quartile satisfaction in this model were non-Hispanic other race/ethnicity, having a college degree, living in the West, being uninsured, and more recent MEPS participation year. Characteristics associated with higher adjusted odds of top quartile satisfaction in the base model were having not graduated high school; being older, female, and

Table 2. Associations of Opioid Prescription Categories with Top Quartile Satisfaction with Care*

Characteristic	Base Model Adjusted OR (95% CI)	*P* Value	Full Model Adjusted OR (95% CI)	*P* Value
Opioid prescriptions in year (ref = 0)				
1 to 5	0.83 (0.79–0.88)	<.001	1.00 (0.94, 1.06)	.99
>6	0.70 (0.63–0.79)	<.001	1.44 (1.27–1.63)	<.001
Age	1.01 (1.01–1.01)	<.001	1.02 (1.02–1.02)	<.001
Female sex	1.10 (1.06–1.14)	<.001	1.16 (1.11–1.20)	<.001
Race/ethnicity (ref = Non-Hispanic White)				
Hispanic (any race)	0.98 (0.91–1.06)	.60	0.95 (0.88–1.02)	.17
Non-Hispanic black	1.11 (1.04–1.18)	.001	1.08 (1.01–1.15)	.02
Non-Hispanic other	0.77 (0.70–0.86)	<.001	0.77 (0.69–0.85)	<.001
Education level (ref <high school)				
Some high school	1.17 (1.05–1.30)	.004	1.11 (0.99–1.24)	.07
High school graduate	1.06 (0.96–1.17)	.24	0.94 (0.85–1.05)	.27
Some college	1.01 (0.92–1.12)	.77	0.88 (0.80–0.98)	.02
College graduate	0.88 (0.79–0.98)	.02	0.73 (0.65–0.81)	<.001
Income as % of FPL (ref <100)				
100 to 124	0.95 (0.86–1.05)	.33	0.91 (0.82–1.01)	.09
125 to 199	1.05 (0.97–1.14)	.21	0.95 (0.88–1.03)	.25
200 to 399	1.09 (1.01–1.16)	.02	0.92 (0.85–0.98)	.02
>400	1.19 (1.11–1.28)	<.001	0.92 (0.85–0.99)	.04
US Census region (ref = Northeast)				
Midwest	1.05 (0.97–1.14)	.21	1.06 (0.98–1.15)	.14
South	1.05 (0.97–1.13)	.26	1.08 (1.00–1.17)	.06
West	0.91 (0.84–0.98)	.02	0.93 (0.85–1.00)	.06
Health insurance (ref = any private)				
Only public	0.99 (0.93–1.05)	.68	1.16 (1.09–1.24)	<.001
Uninsured	0.68 (0.62–0.75)	<.001	0.73 (0.66–0.80)	<.001
MEPS panel year (ref = 2005)	0.96 (0.95–0.96)	<.001	0.95 (0.94–0.96)	<.001
Health status (per 10 unit increment)				
PCS-12			1.33 (1.30–1.36)	<.001
MCS-12			1.58 (1.55–1.62)	<.001

* Data were also adjusted for survey characteristics and panel year. FPL, Federal Poverty Level; MCS-12, SF-12 Mental Component Summary score; OR, odds ratio; PCS-12, SF-12 Physical Component Summary score; ref, analytic reference; SD, standard deviation; CI, Confidence interval; MEPS, Medical Expenditure Panel Survey.

non-Hispanic black; and having a higher income level (Table 2).

In the full model, with adjustment for physical and mental health status added to the base model, those who received 1 to 5 opioid prescriptions had similar odds, whereas those who received ≥6 opioid prescriptions had higher odds of having top quartile satisfaction versus those receiving no opioid prescriptions (Table 2). The corresponding average adjusted proportions with top quartile satisfaction were 25.2% (95% CI, 24.7%–25.8%), 25.3% (95% CI, 24.3%–26.2%), and 32.2% (95% CI, 29.6%–34.8%) for the 0, 1 to 5, and ≥6 opioid prescription categories, respectively. Both higher physical and mental health status also were associated with higher adjusted odds of top quartile satisfaction in the full model. The findings of a sensitivity analysis adding adjustment for outpatient office visits (to all providers) to the full model did not differ substantively from those without office visit adjustment (data not shown, available on request).

Discussion

In a broadly representative US national sample of adults, compared with those receiving no opioid prescriptions in a given year, those who received 1 to 5 opioid prescriptions or ≥6 opioid prescriptions (the latter a surrogate for long-term opioids therapy) each had lower odds of top quartile satisfaction

with care in a base model adjusting only for sociodemographics and year. However, in the full model adding an adjustment for physical and mental health status to the base model, those who received ≥6 opioid prescriptions had higher odds (and those who received 1 to 5 prescriptions similar odds) of top quartile satisfaction than those who received no opioid prescriptions. The findings of the full model were little changed by the addition of further adjustment for outpatient office visits (a marker for health care utilization).

The reversal of the direction of association of receiving ≥6 opioid prescriptions in a year with satisfaction from the base model to the full model likely reflected several factors. Individuals with painful conditions tend to have worse health status than those who do not,[30] and individuals with worse health status tend to be less satisfied with their care than those with better perceived health, as noted in our sample (see Table 1) and in prior studies.[31,32] Therefore, adding health status to the base model (along with sociodemographics and year) captured and adjusted for these effects, thereby revealing (unmasking) a positive association of opioid prescription receipt with satisfaction among individuals with ≥6 opioid prescriptions. Why did the negative association of receiving 1 to 5 opioid prescriptions with satisfaction attenuate but not reverse (ie, become positive) with health status adjustment? We believe this is because receipt of ≥6 prescriptions is an indicator of a relatively high likelihood of receiving long-term opioid therapy and that patients on long-term therapy may tend to have a stronger or enhanced relationship with their prescribing provider than others. Such an enhanced relationship could result from the patient's expectations (perceived need) for opioid therapy being met and the provider's trust in entering into and maintaining a long-term opioid therapy arrangement. By contrast, such enhanced patient-provider relationships are likely to be less prevalent in the context of fewer (1 to 5) opioid prescriptions per year. This would explain why, after adjusting for health status, the direction of the association with satisfaction in the full model was reversed from the base model only in the ≥6-opioid category. Collectively, these observations underscore the critical importance of adjusting for health status in studies of the relationship of prescription opioids with satisfaction with care such as ours.

The observational cross-sectional nature of the analyses precludes causal inferences. In the absence of information regarding causation, we consider there may be at least 2 potential (as yet unproven) and nonmutually exclusive explanations for the findings of our full model. The first speculative explanation may be that receipt of long-term opioid therapy could contribute to or "cause" high patient satisfaction. One way this could occur is if prescription opioid therapy was generally superior to other management approaches in reducing pain and pain-related dysfunction. Yet, to date, there is little consistent research support for this notion, particularly in the context of persistent or chronic pain.[2] A second possibility, raised by others, is that prescription opioids have secondary effects that could have the potential to increase satisfaction with care, apart from the intended relief of pain, such as euphoric effects that patients may perceive improve their mental health (eg, relieve anxiety) in the short term.[33] Still another potential way that opioid prescriptions could influence satisfaction is through the alignment of patient expectations for opioids—apparently widely prevalent in the US population—with the approach offered by clinicians who prescribe them.[5,8] In these contexts, it seems plausible that incentivizing clinicians based on patient satisfaction scores could drive discretionary long-term opioid therapy, as others have postulated and as some circumstantial research evidence suggests.[4–10,12]

A second potential explanation for our findings is that patients who receive opioid prescriptions have personal characteristics (beyond those accounted for in our models) that drive their higher satisfaction with care. Such characteristics might include dispositional factors, such as high self-efficacy for (confidence in) interacting with clinicians, which could lead an individual to be more persuasive in requesting prescription opioids and to be more satisfied with care once opioids have been prescribed.[34] Currently, these potential explanations for our findings are best viewed as unproven hypotheses that are yet to be tested. Future studies designed specifically to test these hypotheses and begin to elucidate the mechanisms of the association of receipt of prescription opioids with satisfaction with care would be helpful.

In addition, items that require more study are the effects of opioid deprescribing, defined as reducing or stopping opioids among patients with longer term use, as called for in blueprints for reducing prescription opioid use and its potential harms.[2] To date, there has been little empirical research demonstrating net long-term health benefits of deprescribing in the

general population of individuals receiving opioids (as opposed to selected high-risk samples).[13] There is also some evidence suggesting the potential for decreased patient satisfaction resulting from opioid deprescribing,[35] and possibly adverse health outcomes (eg, increased short-term mortality.[13]).

The strengths of our study included the use of a large nationally representative sample of adults and the consideration of a range of opioid prescription use (eg, not solely heavy or long-term use). The existing literature has often conflated opioid abuse and misuse with all use of opioids, including more infrequent as-prescribed use, yielding findings with little applicability to most of the general population. The value of our more broadly inclusive approach is underscored by the fact that in our sample over 80% of individuals received no prescription opioids, and of those who did, most received 1 to 5 prescriptions (Table 1). Another strength of our study was an adjustment for an array of patient factors known to influence satisfaction with care (sociodemographics and physical and mental health status).

Our study also had some limitations. Nonresponse to the MEPS may have introduced bias, as the degrees to which receipt of opioid prescriptions or satisfaction with care may differ among responders and nonresponders is unknown. Although our full model included the SF-12, a robust and well-validated health status measure, there may still be some bias in our estimates resulting from incomplete morbidity adjustment. If this were so, it would imply that the true magnitude of the association of prescription opioid receipt with higher satisfaction may be somewhat larger than we observed. In addition, opioid prescriptions were self-reported by MEPS participants. To the extent that under- or overreporting of opioid prescriptions may have occurred, this could bias the findings, particularly if misreporting varied systematically with the level of patient satisfaction with care, although with uncertain net impact. We lacked information regarding the doses (eg, morphine-equivalent units) of prescribed opioids. In addition, we lacked information regarding the timing and sequencing of opioid prescriptions, so it was not possible to discern whether multiple opioid prescriptions in a given MEPS participation year were continuous or separated by off periods. Nonetheless, examining how satisfaction with care is associated with categories of opioid prescription receipt in a given MEPS year, independent of dosage and sequence information, is still worthwhile in shedding light on the nature of opioid prescription-satisfaction relationship.

In conclusion, this study found that in a US national sample, individuals who received ≥6 opioid prescriptions in a year (a marker for long-term opioid therapy) were more likely to have top quartile satisfaction than those receiving fewer or no opioid prescriptions after accounting for health status and, in a sensitivity analyses, health care utilization. Whether the high satisfaction associated with long-term opioid therapy is driven by receipt of opioids or by patient characteristics that increase both the likelihood of receiving opioids and satisfaction with care requires study, as do the effects of deprescribing. In the meantime, our findings provide further preliminary guidance to clinicians, patients, health systems, and policy makers, underscoring the plausibility of the concern that incentivizing physicians based on patient satisfaction scores might contribute to discretionary opioid prescribing.

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