Documentation of Pain Care Processes Does Not Accurately Reflect Pain Management Delivered in Primary Care

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BACKGROUND: Researchers and quality improvement advocates sometimes use review of chart-documented pain care processes to assess the quality of pain management. Studies have found that primary care providers frequently fail to document pain assessment and management.

OBJECTIVES: To assess documentation of pain care processes in an academic primary care clinic and evaluate the validity of this documentation as a measure of pain care delivered.

DESIGN: Prospective observational study.

PARTICIPANTS: 237 adult patients at a university-affiliated internal medicine clinic who reported any pain in the last week.

MEASURES: Immediately after a visit, we asked patients to report the pain treatment they received. Patients completed the Brief Pain Inventory (BPI) to assess pain severity at baseline and 1 month later. We extracted documentation of pain care processes from the medical record and used kappa statistics to assess agreement between documentation and patient report of pain treatment. Using multivariable linear regression, we modeled whether documented or patient-reported pain care predicted change in pain at 1 month.

RESULTS: Participants' mean age was 53.7 years, 66% were female, and 74% had chronic pain. Physicians documented pain assessment for 83% of visits. Patients reported receiving pain treatment more often (67%) than was documented by physicians (54%). Agreement between documentation and patient report was moderate for receiving a new pain medication (k=0.50) and slight for receiving pain management advice (k=0.13). In multivariable models, documentation of new pain treatment was not associated with change in pain (p=0.134). In contrast, patient-reported receipt of new pain treatment predicted pain improvement (p=0.005).

CONCLUSIONS: Chart documentation underestimated pain care delivered, compared with patient report. Documented pain care processes had no relationship with pain outcomes at 1 month, but patient report of receiving care predicted clinically significant improvement. Chart review measures may not accurately reflect the pain management patients receive in primary care.

KEY WORDS: pain; measurement; primary care.
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INTRODUCTION

Concern that pain is inadequately assessed and treated in numerous settings has prompted the Joint Commission and Department of Veterans Affairs (VA), among others, to launch initiatives aimed at improving the quality of pain management. Assessing the quality of pain management is challenging because pain has heterogeneous causes, outcomes are variable, and evaluation and treatment selection depend on many factors. As a result, researchers and quality improvement advocates have used review of chart-documented pain evaluation and treatment processes to define quality pain care and evaluate the effects of quality improvement initiatives.[1,2]

Pain symptoms, both acute and chronic, are among the most common presenting problems in primary care.[3,4] Prior research has found that primary care providers often fail to document attention to pain, leading some to conclude that pain is commonly ignored and undertreated in primary care.[5] This conclusion is warranted if documentation of pain care processes accurately reflects the pain care delivered, but documentation-based pain quality measures have not yet been validated.

Our objectives were to assess documentation of pain care processes in an academic primary care clinic and to evaluate the validity of this documentation as a measure of pain care delivered. We tested two hypotheses: (1) that physicians under-document the pain care they deliver and (2) that patient report of pain care received is more strongly associated with outcomes than is documentation of pain care.

METHODS

Participants and Procedures

This study is a secondary analysis of a prospective observational study of pain assessment in primary care. Study procedures have been previously reported.[6] We enrolled participants from September 2005 to March 2006 at a single large university-affiliated general internal medicine clinic. Inclusion criteria were age ≥18 years and at least one previous visit to the same clinic. We excluded those who were unable to complete a face-to-face interview in English. For this analysis, we also excluded participants who reported no pain at all in the past week during the baseline interview.

A research assistant approached consecutive available patients while they were waiting to see their physician and invited them to enroll in a study of symptoms in primary care. We used a two-step informed consent process to minimize both disruption to clinic flow and bias in the study. Initially, the research assistant informed potential participants by presenting a brief study fact sheet. Those who initially agreed to participate were asked two general questions, one about the main reason for the visit and the other about concerns they would like to discuss with the doctor that day. Study participants then saw their physician as scheduled. They were asked to return to a designated room in the clinic to be interviewed immediately after completing their physician visit.

Written informed consent was completed after the visit and before the baseline interview. Participants were not notified of the specific pain focus of the study at any time; rather, the study was described on the fact sheet and consent form as being "about why people go to the doctor, about common symptoms people have, and about how doctors treat those symptoms." The University of North Carolina Biomedical Institutional Review Board approved the study protocol and informed consent process, and all participants provided written informed consent.

All baseline survey data were collected by face-to-face interview. One month later, the research assistant called participants for a follow-up telephone interview.

Patient Measures

Brief Pain Inventory (BPI). Participants completed the BPI, our primary measure of pain severity, at baseline and 1 month. The BPI has been validated in primary care and is recommended as a core outcome measure for pain studies.[7–9] It includes two scales, a four-item measure of pain intensity (BPI severity) and a seven-item measure of pain-related functional impairment (BPI interference). Each scale has an overall range of 0–10, with higher scores representing worse pain. We dichotomized BPI severity as moderate-severe (BPI severity ≥4) or mild (BPI severity <4).

Patient report of pain care processes. Immediately after their clinic visit, participants answered three yes/no questions about what their doctor did for their pain that day. They reported whether or not they received: (1) advice about how to manage pain, (2) any new medication for pain, and (3) any new treatment other than medication for pain. We defined "any new pain treatment" as receiving any of the three types of pain care.

Patient Health Questionnaire (PHQ). We used the PHQ-8 to assess depression at baseline. This measure excludes the item on suicidal thoughts from the original PHQ-9, but has similar test characteristics for detecting depression.[10–12] A score ≥10 has a sensitivity of 80% and a specificity of 92% for major depressive disorder.[13] We classified patients as having anxiety if they had panic disorder or other anxiety disorder according to PHQ scoring criteria. The overall accuracy of PHQ anxiety modules is 91%, compared with diagnosis of any DSM-III-R anxiety disorder by a mental health professional.[14]

Other variables. During the baseline interview, we asked participants to report their race/ethnicity, whether they saw their "regular doctor" at the current visit, and the location and duration of pain. We allowed them to report up to five separate pain locations; for this analysis, we dichotomized the number of pain locations as one vs. two or more sites. We categorized the duration of pain as chronic if it was present for ≥6 months.

Chart Review Measures

All chart-based measures came from the electronic medical record (EMR). Physicians dictate clinical notes and enter orders directly into the EMR. Two coders abstracted data from physician notes and orders for the index clinic visit, as well as from administrative and pharmacy records. A third coder reviewed abstracted data for accuracy.

Pain care process variables. We abstracted the following pain care processes: (1) pain assessment (any mention of location or duration of pain), (2) order of any diagnostic test, (3) provision of advice/education about management of pain symptoms, (4) prescription of a new pain medication, (5) change in dose or schedule of existing pain medication, and (6) new non-pharmacologic pain treatment (e.g., specialty or therapist referral for pain management, office procedure, order for prosthetics). We also abstracted documented plans to continue current pain therapy without change. In addition to individual pain care processes, we created a composite variable, "any new pain treatment," if documentation of advice, new pain medication, or new non-pharmacologic pain treatment was present.

Other variables. We abstracted insurance information from the administrative fields and categorized patients as privately insured (any commercial health insurance), publicly insured (Medicare or Medicaid only), or uninsured (no health insurance listed). We abstracted age, sex, current medications, physician type (resident or attending), medical comorbidities, and pain specialty visits. Participants were counted as using opioids for pain if they had a prescription for any Schedule 2 or 3 opioid analgesic on their current medication list; we did not include tramadol or cough preparations as opioids. We considered patients to have concurrent pain clinic attendance if we found evidence of an encounter in any of three pain specialty clinics (anesthesia pain clinic, spine clinic, or internal medicine pain clinic) within the prior year. Medical comorbidities, abstracted from the problem list, included the following ten common chronic conditions: arthritis, asthma/chronic lung disease,

cancer, coronary artery disease, diabetes, heart failure, hypertension, liver disease, kidney disease, and stroke.[15]

Analysis

We used descriptive statistics to report baseline characteristics and rates of documented pain care processes. Using chi-square tests, we compared rates for participants with moderate-severe pain to those for participants with mild pain.

We calculated kappa statistics to assess agreement between documentation and patient report for three pain care processes: (1) provision of advice/education about management of pain symptoms, (2) prescription of a new medication, and (3) new non-pharmacologic treatment. We also compared agreement between documentation and patient report on the any new pain treatment composite variable (positive if any of the three individual pain care processes was present).

We used analysis of covariance to separately model whether receipt of any new pain treatment according to physician documentation or patient report predicted subsequent improvement in pain severity at 1-month follow-up. Secondarily, we fit separate models for each of the three individual pain care processes (i.e., advice, new medication, and new non-pharmacologic treatment). In all models, change in BPI severity score between the visit and follow-up interview was the dependent variable. We adjusted models for demographic variables and potential confounders at baseline: age, sex, race (white/nonwhite), health insurance status (public/private/none), depression (yes/no), anxiety (yes/no), chronic pain (yes/no), number of pain sites (1/ ≥2), and opioid use (yes/no). For all models, we report the mean change and 95% confidence intervals (CI).

We imputed missing data from BPI and PHQ scales using best subset regression if one value was missing; we did not impute data if more than one value was missing from a scale. Our statistical package was Stata version 10.1 (Stata Corp., College Station, TX).

Table 1. Baseline Characteristics of Participants (n=237)

Characteristic	Mean (SD) or %
Age, years	53.7 (13.2)
Women	66.2
Race	
White	66.2
Black	29.1
Other	4.6
Education beyond high school	42.2
Insurance	
None	21.9
Public only	35.0
Private, any	43.0
Depression	31.7
Anxiety	42.6
Number of medical comorbidities[a]	2.0 (1.5)
Chronic pain	74.2
Pain chief complaint	40.1
BPI severity, mean (SD)	5.4 (2.3)
More than one pain site	73.8
Opioid use	31.2
Pain clinic attendance	14.8

[a]*From a list of ten common chronic conditions (arthritis, asthma/chronic lung disease, cancer, coronary artery disease, diabetes, heart failure, hypertension, liver disease, kidney disease, and stroke)*

Table 2. Documentation of Pain Care Processes Overall and by Pain Severity at Baseline

Pain care process	Number (%) with documentation of process			
	Overall (n=237)	Moderate-severe pain (n=187)	Mild pain (n=50)	p-value*
Pain assessment	197 (83)	165 (88)	32 (64)	<0.001
Diagnostic test	49 (21)	43 (23)	6 (12)	0.088
Advice	34 (14)	29 (16)	5 (10)	0.974
New medication	75 (32)	65 (35)	10 (20)	0.046
Change in existing medication	27 (11)	25 (13)	2 (4)	0.064
New non-pharmacologic treatment	52 (22)	48 (26)	4 (8)	0.007
Plan to continue current therapy	56 (24)	46 (25)	10 (20)	0.497
Any new treatment composite	129 (54)	112 (60)	17 (34)	0.001

**Chi-square test for difference between participants with moderate-severe pain (BPI severity ≥4) and those with mild pain (BPI severity <4)*

RESULTS

Of 548 patients who were invited to participate, 357 initially agreed, 187 refused, and 4 were excluded for being unable to complete the interview in English; 277 patients completed baseline interviews. Those who initially agreed to participate but did not complete the interview cited reasons such as lack of time or need to go to the laboratory or radiology department after their visit.[6] We restricted this analysis to the 237 participants who reported experiencing any pain in the week before the baseline interview. Of these, 199 (84%) were reached for follow-up. The 38 participants who were lost to follow-up were similar to those who completed it, but fewer had more than one pain site (60% vs. 76%, p=0.04).

Patient Characteristics

Participants' mean age was 53.7 years, and 66% were female (Table 1). Participants saw 81 different physicians; 73% reported they saw their "regular doctor" at the index visit. The mean baseline BPI severity score was 5.2, consistent with moderate pain intensity. At baseline, 79% had moderate or severe pain. Nearly three-quarters of participants had chronic pain (at least one pain symptom present for ≥6 months), and 74% reported pain in more than one location. Nearly one-third of participants were receiving an opioid analgesic at baseline. Medical and psychiatric comorbidities were common. Overall, 48% had either depression or anxiety; among those with chronic pain, depression or anxiety was present in 56%.

Documentation of Pain Care Processes

Table 2 shows the frequency of specific pain care processes documented in the chart. Overall, physicians documented pain assessment for 197 (83%) of the visits. Documentation of any new pain treatment was present for 54%. For nearly one-quarter of visits, physicians documented a plan to continue current pain therapy. Patients with moderate-severe pain were significantly more likely to have documented pain assessment (88% vs. 64%, p<0.001) and any new pain

Table 3. Agreement Between Documented and Patient-Reported Pain Care Processes

Pain care process	Documented n (%)	Patient-reported n (%)	Kappa	p-value
Any new treatment composite	129 (54)	159 (67)	0.34	<0.001
Advice	34 (14)	116 (49)	0.13	0.003
New medication	75 (32)	81 (34)	0.50	<0.001
New non-pharmacologic treatment	52 (22)	75 (32)	0.35	<0.001

treatment (60% vs. 34%, p=0.001) compared with those who had mild pain.

Overall, patients reported receiving more pain care than was documented (Table 3). This was true for each of the three processes evaluated and for the composite new treatment measure. Agreement between documentation and patient report was best for new pain medication (k=0.50) and worst for pain management advice (k=0.13).

Relationship of Pain Care Processes with Pain Outcomes

Among 199 patients with follow-up data, the mean change in BPI severity was -1.3 (SD 2.8) on a 0–10 scale (negative change indicates improvement in pain). Overall, 58% of patients reported improvement in pain intensity: 49% among those with and 81% among those without chronic pain.

In multivariable models, receipt of any new pain treatment *according to chart documentation* was not significantly associated with subsequent improvement in pain severity compared with no documentation of new pain treatment (difference between groups=0.6, p=0.134). In contrast, patients who *reported* receiving any new pain treatment improved significantly more than those who reported not receiving any new treatment (difference between groups=1.2, p=0.005). A similar pattern emerged when we fit separate models for each of the three individual pain care processes: *patient-reported* receipt of pain management advice and *patient-reported* receipt of new medication predicted subsequent pain improvement. However, none of the documented processes were significantly associated with subsequent change in pain severity. Table 4 shows adjusted BPI severity score changes for those who did and those who did not receive each of the pain care processes, according to both documentation and patient report. In general, for pain intensity scales scored from 0–10, a change of ≥1 point or 10–20% is considered to be clinically significant, and a change of ≥2 points or 30% is considered to be at least moderately important.[16]

DISCUSSION

Using patient report as the reference, we found that documentation of pain care processes in the medical record underestimated pain management delivered by physicians. Notably, patient-reported receipt of pain management predicted clinically significant improvement, whereas chart-documented pain care was not associated with patient outcomes. This pattern was observed for both a composite measure and individual pain care processes. These findings support our hypotheses and suggest that patient report may more accurately reflect the quality of pain care than does chart documentation.

Our study illustrates the medical complexity and competing demands that form the context of pain management in many primary care settings. Chronic disease comorbidity was common; 64% of participants had two or more chronic medical conditions and 48% had concurrent depression or anxiety. Most patients had primary concerns that were not pain-related. Because the majority of pain problems in this study were chronic in nature, we presume many of them had been addressed in previous visits. Given these factors, we are unsure what optimal pain assessment and management documentation rates would be, but something less than 100% would likely be appropriate.

Despite the sample's clinical complexity and pain chronicity, we found relatively high rates of EMR-documented pain assessment and management. Rates of documented pain assessment (83%) and composite treatment (54%) in our study are nearly twice as high as those reported by Mularski et al. in their prior study based in VA primary care (49% and 28%, respectively).[2] Whether this reflects a difference in actual practice or a difference in documentation between the two clinics is unclear. Differences in documentation could be

Table 4. Adjusted Change in BPI Severity According to Documented or Patient-Reported Receipt of Pain Care Processes (n=199)

Pain care process	BPI severity score, mean change (95% CI)[a]			
	Received	Did not receive	Difference	p-value*
Documented processes				
Any new treatment composite	-1.6 (-2.1, -1.1)	-1.0 (-1.6, -0.4)	0.6 (-1.4, 0.2)	0.134
Advice	-1.8 (-2.8, -0.8)	-1.3 (-1.7, -0.8)	0.6 (-1.6, 0.5)	0.307
New medication	-1.6 (-2.3, -0.9)	-1.2 (-1.7, -0.8)	0.3 (-1.2, 0.5)	0.428
New non-pharmacologic treatment	-1.1 (-2.0, -0.3)	-1.4 (-1.8, -1.0)	0.3 (-0.7, 1.2)	0.596
Patient-reported processes				
Any new treatment composite	-1.7 (-2.2, -1.3)	-0.5 (-1.2, 0.1)	1.2 (-2.0, -0.4)	0.005
Advice	-1.8 (-2.3, -1.2)	-0.9 (-1.4, -0.4)	0.9 (-1.6, -0.1)	0.024
New medication	-2.2 (-2.8, -1.6)	-0.9 (-1.3, -0.4)	1.3 (-2.1, -0.5)	0.001
New non- pharmacologic treatment	-1.8 (-2.5, -1.2)	-1.1 (-1.6, -0.7)	0.7 (-1.5, 0.1)	0.105

[a]*Scores on 0–10 scale, where higher scores indicate worse pain; negative change scores represent improvement*

**P-values are for differences between patients who received and those who did not receive a given pain care process, adjusted for the following baseline variables: age, sex, race, health insurance status, depression, anxiety, chronic pain, number of pain sites, and opioid use*

explained by the fact that physicians in our study dictated notes, whereas those in the VA study typed directly into the EMR. Typing is a more time-demanding mode of entry than dictating, and may have affected the quality and quantity of documentation.[17]

We conducted this study in a practice that lacked clinical reminder tools to prompt physician documentation of pain management. Many VA and non-VA clinics have implemented clinical reminders to facilitate greater documentation of pain management, but studies have not yet proven these tools to be effective in improving care. A study by Saigh et al. illustrated some potential pitfalls.[18] They found that implementation of a mandatory pain assessment module in their EMR did not increase overall documentation of pain assessment, but did increase contradictory documentation ("no pain" documented in the mandatory pain assessment field despite free-text documentation of pain evaluation). Providers in that study reported the pain assessment tool was cumbersome and did not alter their pain assessment practice.

We used patient report of pain management received as the reference standard in this study. Although we recognize that patient report may not perfectly reflect physicians' words or actions during the encounter, patient perceptions are clearly relevant to symptom management. Previous studies have found that patient perceptions of a visit more strongly predict outcomes than observation-based or physician-reported measures.[19,20] One possible explanation is that messages delivered by a physician are sometimes not "received" or understood by the patient. Additionally, patient perceptions may reflect intangible therapeutic factors that affect outcomes, such as a caring bedside manner.[21]

Our study has several limitations. First, we simply asked patients whether or not they had received three types of pain care (i.e., advice, medication, and non-pharmacologic treatment) during the visit. We were primarily interested in treatment and did not ask about other aspects of the visit, such as pain assessment (e.g., history and physical exam). Given the expected preponderance of chronic pain, we thought ongoing attention to management of the pain would likely be more important than assessment in terms of patient outcomes. Second, we did not assess patient perceptions of the value of the care they received. This would require in-depth interviews that were beyond the scope of our study. Third, this study was conducted in a single university-affiliated clinic with an EMR, and results may not generalize to other settings.

Given our findings, we believe that chart review-based pain process measures should be used with caution until evidence of their relationship with pain care quality and patient outcomes is established. A potential hazard for quality improvement programs that rely on chart review measures is that they could promote increased documentation without changing the quality of the actual care delivered. In our study, 49% of patients reported receiving advice from their physician about managing pain, but only 14% of physicians documented giving such advice. If all physicians who gave advice started documenting it, an apparent 350% increase in physician advice would be detected without any change in patient care. An intervention that leads providers to spend more time on documentation could even reduce face time with patients, adversely affecting care.[22] Using administrative data to evaluate use of specific evidence-based practices for common pain conditions may be a better approach than using chart-documented pain assessment and management processes.

In summary, we found that documentation of pain care processes underestimated pain management, when compared with patient report. Documentation measures had no relationship with pain outcomes at 1 month, whereas patient report of care received predicted subsequent pain improvement. We conclude that chart review-based pain care process measures may insufficiently reflect the quality and effectiveness of pain management in primary care.

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