EDUCATION & TRAINING SECTION

Utilizing a Faculty Development Program to Promote Safer Opioid Prescribing for Chronic Pain in Internal Medicine Resident Practices

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Abstract

Objective. To implement a skills-based faculty development program (FDP) to improve Internal Medicine faculty's clinical skills and resident teaching about safe opioid prescribing. **Design.** An FDP for Internal Medicine attendings that included a one-hour didactic presentation followed immediately by an Objective Structured Clinical Examination (OSCE) that focused on assessing and managing opioid misuse risk, opioid treatment outcomes (benefits and harms), and aberrant opioid use behaviors. The evaluation compared pre- and three-months-post-FDP changes in faculty's safe opioid prescribing knowledge, attitudes, confidence (clinical and teaching), and self-reported resident teaching. **Results.** The 25 Internal Medicine faculty participants had a mean of 13 years in clinical practice, including 10 years precepting residents. During the three months post-FDP, faculty treated a mean of 22 patients with chronic pain on long-term opioids and precepted a mean of seven residents caring for patients on long-term opioids. At three months post-FDP, there were significant improvements in correct responses to knowledge questions (68% to 79% $P=0.008$), "high-level" confidence in safer opioid prescribing clinical practice (43.5% to 82.6% $P=0.007$) and resident teaching (45.8% to 83.3%, $P=0.007$), and improvements in alignment of desired attitudes toward safer opioid prescribing. There were nonsignificant increases in self-reported safe opioid prescribing resident teaching. **Conclusions.** A skills-based faculty development program that includes a lecture followed by an OSCE can improve Internal Medicine faculty safe opioid prescribing knowledge, attitudes, and clinical and teaching confidence. Improving resident teaching may require additional training in safe opioid prescribing teaching skills.

Key Words: Chronic Pain; Opioid Medications; Faculty Development

Introduction

Chronic pain is one of the most common reasons patients seek medical care [1]. In the United States, both inadequate treatment of chronic pain and prescription opioid-related morbidity and mortality are significant public health problems [2–5]. These issues have been associated

with increased opioid prescribing for chronic pain management, starting in the 1990s [4]. In response, multiple organizations have published safer opioid prescribing guidelines [6–10]. Although guidelines are intended to improve safe opioid prescribing for chronic pain, incorporating them into patient care can be challenging [11,12],

especially for resident physicians [13–15]. Moreover, studies have demonstrated that providers inconsistently adhere to guideline recommendations [16–18].

Physician education is a necessary strategy for improving adherence to safe opioid prescribing guidelines to address the dual crises of the undertreatment of chronic pain and overprescribing of opioid analgesics [19,20]. However, physicians at all levels of training remain inadequately skilled in chronic pain management, including safe opioid prescribing [21–26]. Although there is a growing literature addressing continuing medical education in safer opioid prescribing [27–30], significantly fewer studies describe resident training [31–33]. We previously described a safe opioid prescribing skills-based resident education program utilizing an Objective Structured Clinical Examination (OSCE) that found improvements in Internal Medicine resident attitudes, knowledge, confidence, and self-reported opioid prescribing practices [34]. Residents are an important target audience for this type of educational intervention as most physicians develop lifelong clinical skills during residency training [35]. However, training residents alone may have less impact if their supervising faculty do not support the resident's newly learned safe opioid prescribing clinical practices through reinforcement and role modeling [36–38]. Faculty preceptors have been shown to influence resident clinical practices and career paths [39]. Given the important role of the faculty preceptor in resident clinical practice, we implemented a skills-based Faculty Development Program (FDP) to improve Internal Medicine faculty's safe opioid prescribing knowledge, confidence, attitudes, and practices with the hopes that these skills would be disseminated to their residents during outpatient precepting. The FDP included a lecture followed immediately by a four-station OSCE, allowing faculty to practice newly learned safe opioid prescribing skills in a realistic setting and receive immediate feedback from faculty experts. Although OSCEs have been used to assess residents' and faculty's addiction assessment and management and safe opioid prescribing skills [34,40], this evaluation seeks to use an OSCE as a teaching tool to improve faculty preceptors' safe opioid prescribing skills as a means of improving their teaching of residents.

Methods

Participants

The participants were 25 Internal Medicine (IM) faculty who supervised IM residents in primary care practices. Faculty preceptor participants were recruited from Boston Medical Center and its affiliated Veterans Affairs Medical Center and Community Health Centers with fliers and e-mail announcements describing the half-day safe opioid prescribing FDP, which offered free Continuing Medical Education and Risk Management credits. Due to resource constraints, only a limited

number of the total faculty at each institution were able to participate in the FDP as enrollment was on a first-come, first-served basis.

Faculty Development Program Description

The half-day Faculty Development Program focused on increasing knowledge about guideline-based safer opioid prescribing practices and improving patient communication skills [41]. The program consisted of a didactic followed immediately by four OSCE stations (ie: structured patient cases). The program content (e.g., assessing opioid misuse risk, monitoring for safe opioid use, assessing and responding to worrisome opioid-taking behaviors) was selected based on an informal assessment of which opioid-related clinical challenges faculty preceptors struggle with. The FDP enrollment was limited to four faculty participants per session and was offered seven times. The FDP was supported by a grant from the National Institute on Drug Abuse.

Lecture

A one-hour lecture was delivered by an expert (DPA) in primary care, safe opioid prescribing for chronic pain, addiction medicine, and medical education. The lecture included how to assess chronic pain and function; initiate and adjust opioid dosing; implement universal precautions when monitoring for prescription opioid misuse [42]; assess and manage worrisome opioid-taking behaviors; discontinue or taper opioids when indicated; and counsel patients who are identified with active illicit substance use.

Observed Structured Clinical Examination

The Observed Structured Clinical Examination sessions were completed immediately after the lecture and included a 15-minute orientation followed by four 20-minute OSCE stations with station-specific tasks. The OSCE station-specific tasks (Table 1) included assessing baseline opioid misuse risk, discussing potential risks and benefits and monitoring strategies, assessing and discussing aberrant opioid-taking behaviors, discussing opioid taper due to lack of benefit or increased risk, and performing brief counseling for a patient with active illicit substance use while taking opioids for chronic pain.

OSCE Stations

The OSCE experience started with the faculty participant reading the case summary and three station-specific tasks (two minutes), followed by interviewing the standardized patient (SP) (10 minutes), a verbal self-assessment (one minute), SP feedback (one minute), faculty expert observer feedback (five minutes), and finally, poststation written evaluation (one minute).

Table 1. OSCE station patient profile and clinical tasks

Station	Patient Profile	Clinical Tasks
1	Robert Jones • 54-year-old male, hardware store manager, follow-up visit to primary care provider • Chronic post-traumatic ankle and foot pain not responding to nonsteroidal anti-inflammatory drugs • Being considered for opioid analgesics	1. Assess for baseline opioid misuse risk (e.g., screen for substance use) 2. Discuss risks and benefits of opioids for chronic pain 3. Discuss universal precautions and monitoring strategies (i.e., signed patient provider agreement, urine drug testing, pill counts)
2	Mary Tempo • 44-year-old female, nurse on disability, in long-term recovery from benzodiazepine use disorder, seeing primary care provider for past 9 months • Chronic back pain, failed back surgery, improved pain and function on chronic opioids • Recent increase in back pain and concerning behaviors (nonadherence with urine drug tests or pill counts)	1. Assess cause of aberrant opioid-taking behaviors 2. Give feedback and discuss concerns about aberrant opioid-taking behavior 3. Discuss appropriate strategies for addressing the aberrant opioid-taking behavior and change in treatment plan
3	Lindsey Beecher • 43-year-old female, elementary school teacher, seeing primary care provider for past 6 months • Chronic painful diabetic neuropathy not responding to high-dose opioids • Recent nonadherence with monitoring (urine drug tests, pill counts) and recent visit to emergency department for worsening pain and opioid withdrawal in setting of running out of her opioids early	1. Discuss unexpected urine drug test results and aberrant opioid-taking behavior 2. Discuss the lack of benefit and increased risk of continued opioid therapy 3. Discuss the need for an opioid taper and addiction treatment referral
4	Sam Miller • 45-year-old male, carpenter, presents for the first time after a recent hospital stay for chest pain • During his hospital stay, his chronic hip pain (secondary to avascular necrosis) was managed with hydrocodone/acetaminophen, and he was discharged with a 2-week opioid supply to last until his primary care appointment • The opioid is allowing him to be more productive at work and less irritable at home • He drinks 1–2 beers on weekends and snorts cocaine 2–3 times per week	1. Assess and discuss pain and function and risks on current opioid dose 2. Discuss his cocaine use by performing a brief intervention (i.e., counseling) 3. Discuss the new treatment plan for his chronic pain and cocaine use

OSCE = Objective Structured Clinical Examination.

Faculty Expert Observers

All 11 OSCE faculty expert observers were experienced in primary care, safe opioid prescribing, and medical education. They attended a 90-minute orientation to review FDP logistics and discuss how to formulate poststandardized patient interview feedback using a uniform participant assessment tool that included elements on general communication skills (e.g., open-ended questions, nonjudgmental style, empathy), station-specific tasks (Table 1), and general organization of the interview (e.g., time management, prioritization). Faculty observers sat discreetly in the exam room during the faculty participant–SP interviews. Faculty observers were paid \$500 for their half-day participation in the FDP during nonclinical time.

Standardized Patients

Our six standardized patients were actors who were given a detailed patient role for their OSCE station. The SPs were trained by the FDP directors (DPA, AHJ) with a 90-minute orientation that included introduction to detailed patient roles, approaches to the interview, and principles of constructive feedback. The SPs were paid \$100 for their half-day participation in the FDP.

Outcomes

Faculty Participant Surveys (Pre-FDP and Three Months Post-FDP)

Faculty participants completed baseline (pre-FDP) and three-month-follow-up (post-FDP) surveys that were developed specifically for this program by the program directors who are experts in safe opioid prescribing (DPA), education (AHJ), and educational evaluation (BB). The pre- and post-FDP surveys assessed faculty participant safe opioid prescribing knowledge, attitudes, clinical confidence, and resident teaching confidence and practice. The questionnaires used did not undergo formal validity testing as the evaluation was developed for a newly designed educational program without a known gold standard or preexisting criterion by which to validate. Therefore, we do not have information regarding external validity. We felt that despite this limitation, the surveys had reasonable face validity as they addressed specific aspects of the curriculum and were designed in concert with the FDP. With regards to internal validity, we conducted Cronbach's alpha analysis to determine the internal consistency of the survey questions that we asked in each category; these categories are defined

Table 2. Change in safe opioid prescribing attitudes and confidence

Attitudes (N = 25) “Agree” or “Strongly Agree” with the following statement. . .			
	Pre, No. (%)	Post, No. (%)	P Value
a. Most patients taking long-term opioids for chronic pain can be safely managed by me in primary care.	20 (80.0)	25 (100.0)	<0.05
b. Most patients taking long-term opioids for chronic pain can be safely managed by residents in primary care.	10 (40.0)	15 (60.0)	0.06
Confidence in Clinical Practice (N = 22)* In the outpatient setting, how confident are you with the following practices related to prescribing long-term opioids for patients with chronic pain? (percent 4 or 5 “Very Confident” on 5-point Likert scale)			
a. Discussing risks and benefits of long-term opioid therapy	21 (95.5)	22 (100.0)	0.32
b. Distinguishing inappropriate “drug-seeking” from appropriate “pain relief-seeking” behaviors	7 (31.8)	16 (72.7)	<0.05
c. Identifying risk factors for prescription opioid misuse (e.g., using more than prescribed)	13 (59.1)	20 (90.9)	<0.05
d. Discussing results of abnormal urine drug tests with patients (e.g., illicit drug present or absence of prescribed opioid)	12 (54.5)	17 (77.3)	0.10
e. Discussing aberrant opioid-taking behaviors with patients (e.g., requests for early refills, lost prescriptions)	15 (68.2)	19 (86.4)	0.10
f. Knowing when long-term opioid therapy is benefiting a patient	10 (45.5)	16 (72.7)	0.06
g. Stopping opioid therapy due to lack of benefit or increased risk	7 (31.8)	10 (45.5)	0.40

*Three faculty left these questions blank at one or both time points; these faculty were excluded from analysis.

below. Faculty participants signed a consent outlining the voluntary nature of this study.

The surveys included the following sections:

Knowledge. Five multiple-choice questions addressed opioid analgesic efficacy and risk, prescription opioid misuse risk factors, universal precautions in opioid prescribing, assessment of aberrant opioid-taking behaviors, and signs of an opioid use disorder.

Attitudes. Two items utilizing a five-point Likert scale (1 = “disagree strongly,” 2 = “disagree,” 3 = “neither agree nor disagree,” 4 = “agree,” 5 = “agree strongly”) assessed faculty level of agreement that patients on long-term opioids for chronic pain may be safely managed by them or their residents. Pre and post comparison were made of the percentage of participants who reported “agree” or “strongly agree” for each item (Table 2).

Clinical Confidence. We asked seven questions utilizing a five-point Likert scale (1 = “not at all confident,” 5 = “very confident”) regarding specific safer opioid prescribing practices. Pre and post comparisons were made of the percentage of participants who reported “high confidence” (4 or 5 = “very confident”) for each item (Table 2). There was also a summary question: “Overall, in the outpatient setting, how confident do you feel to initiate and manage long-term opioid therapy in patients with chronic pain?”

Resident Teaching Confidence. Three items utilized a five-point Likert scale (1 = “not at all confident,” 5 = “very confident”) comparing confidence in teaching residents about “starting opioid therapy for a patient with chronic pain,” “starting insulin for a patient with diabetes,” and “starting treatment for menopausal symptoms” (Figure 1). Pre and post comparisons were made of the percentage of participants who reported

“high teaching confidence” (4 or 5 = “very confident”). Our hypothesis was that faculty would have high teaching confidence at both time points in starting insulin for a patient with diabetes mellitus, low teaching confidence at both time points in starting treatment for a woman with menopausal symptoms [43], and improved confidence from pre- to post-FDP in initiating opioid therapy for a patient with chronic pain.

Resident Teaching Practice. Seven items utilized a five-point Likert scale (1 = “never/rarely,” 2 = “sometimes,” 3 = “half of the time,” 4 = “usually,” 5 = “always”) regarding how often the participants teach residents about specific safe opioid prescribing topics. Participants were excluded from these items if they had not precepted residents caring for patients prescribed opioids for chronic pain in the three months before the survey. Pre and post comparisons were made of the percentage of participants who reported “high teaching practice frequency” (4 = “usually,” 5 = “always”) for each item (Table 3).

Analysis

We reported results as the percentage of participants who reported a score of 4 or 5 on the five-point Likert scale pre- and postintervention, which referred to “usually” or “always” and “agree” or “strongly agree,” depending on the question, and assessed the statistical significance of the change using McNemar’s test. For the knowledge section, we assessed mean pre- and post-FDP scores means and standard deviations and compared them using paired *t* tests. Baseline faculty characteristics were reported using mean and standard deviation or median and interquartile range (IQR), depending on distribution. Changes with two-tailed *P* < 0.05 are reported as significant. All

Figure 1. Faculty confidence in teaching. *When precepting residents in the outpatient setting, how confident are you in teaching about the following?* Teaching confidence is represented as the percentage of preceptors who chose “agree” or “strongly agree,” or 4–5 out of 5, on a Likert scale; 95% confidence intervals are represented as error bars.

Table 3. Change in safe opioid prescribing resident teaching

Resident Teaching (N = 21)*			
<i>When precepting a resident caring for a patient with chronic pain on long-term opioids, how often do you teach them about... (percent responding “Usually” or “Always”)</i>			
	Pre, No. (%)	Post, No. (%)	P Value
a. Identifying risk factors for opioid misuse	15 (71.4)	17 (81.0)	0.16
b. Assessing the risks of long-term opioid therapy	15 (71.4)	17 (81.0)	0.16
c. Assessing the benefits of long-term opioid therapy	12 (57.1)	16 (76.2)	<0.05
d. Interpreting unexpected urine drug test results	8 (38.1)	12 (57.1)	<0.05
e. Monitoring for illicit drug use and prescription opioid misuse (e.g., urine drug tests, pill counts)	14 (66.7)	14 (66.7)	1.00
f. Assessing the etiology for aberrant opioid-taking behaviors with patients (e.g., requests for early refills, lost prescriptions)	13 (61.9)	15 (71.4)	0.41
g. Assessing when to stop opioid therapy due to lack of benefit and/or increased risk	9 (42.9)	12 (57.1)	0.32

*At one or both time points, three faculty reported precepting no residents, and one faculty participant left these questions blank; these faculty were excluded from analysis.

statistical analysis was conducted using SAS/STAT software, version 9.4, of the SAS System for Microsoft Windows [44]. The Boston University Medical Campus Institutional Review Board determined this education program evaluation to be exempt from further review.

Results

Twenty-five Internal Medicine (IM) faculty who practice and precept residents either at an urban safety net academic hospital (N=11), a community health center (N=6), or a Veterans Affairs hospital (N=8)

participated in the Faculty Development Program. This was a small number in comparison with the total number of preceptors at their respective institutions as the FDP could only accommodate a limited number of preceptor trainees. The faculty participants averaged (SD) 13.3 (8) years in clinical practice with 9.9 (6.3) years’ experience precepting residents. During the three months before the FDP, the faculty estimated that they had seen a median (IQR) of 50 (20–80) patients with chronic pain, of whom a median of 17.5 (10–25) were established patients already on chronic opioids, 1 (0–2) was an established patient newly started on chronic opioids, and 2 (1–5) were

new patients already receiving chronic opioids. During the three months before the FDP, the faculty reported precepting a median of six residents (4–10) caring for patients on chronic opioids. At baseline, most faculty participants “usually” or “always” had patients sign a patient provider agreement (95%) and regularly monitored patients on controlled substances with urine drug testing (86%). Only 5% “usually” or “always” monitored their patients’ opioid use by conducting pill counts.

Knowledge and Attitudes

At three months post-FDP, the faculty participants’ knowledge scores significantly improved on the five questions from a baseline of 68% to 79% questions correct ($P = 0.008$). At three months post-FDP, there was a significant increase in faculty participants’ agreement that they and their residents could safely manage patients who were taking long-term opioids for chronic pain (Cronbach’s $\alpha = 0.78$) (Table 2).

Confidence

Overall, the percentage of faculty participants reporting “high-level confidence” (i.e., 4 or 5 on a five-point scale) to initiate and manage long-term opioid therapy in patients with chronic pain improved from 43.5% to 82.6% ($P = 0.007$) on a single-item summary question with acceptable internal consistency (Cronbach’s $\alpha = 0.76$) (Table 2). At three months post-FDP, faculty participants’ “high-level confidence” improved in all areas, with significant improvements in “distinguishing inappropriate ‘drug-seeking’ from appropriate ‘pain relief-seeking’ behaviors” (31.8% to 72.7%, $P = 0.01$) and “identifying risk factors for prescription opioid misuse” (59.1% to 90.9%, $P = 0.02$). More than 70% of participants felt “highly confident” in performing at least six of the seven practices surveyed. Only 45.5% of faculty had “high confidence” regarding the remaining practice of “stopping opioid therapy due to lack of benefit or increased risk” at follow-up.

Resident Teaching Confidence

Overall, faculty participants’ “high-level confidence” (i.e., 4 or 5 on a five-point scale) in teaching residents about safe opioid prescribing for chronic pain significantly improved from 45.8% to 83.3% ($P = 0.007$); however, the internal consistency was poor (Cronbach’s $\alpha = 0.37$). With regards to confidence in teaching initiation of safe opioid prescribing vs initiation of medications for other common chronic conditions, “high-level confidence” in teaching safe initiation of opioids increased, though not significantly (60.9% to 82.6%, $P = 0.10$), whereas, as predicted, confidence in teaching initiating insulin therapy started and remained high (91.3% to 100%, $P = 0.16$), and teaching initiating treatment for menopausal symptoms started and remained low (68.2% to 63.6%, $P = 0.65$) (Figure 1).

Resident Teaching Practice

A total of four faculty were excluded from the resident teaching practice analysis because three reported not precepting any residents treating patients with chronic pain on chronic opioids at baseline and/or during the three months post-FDP, and one did not answer any of the resident teaching questions (Table 3). Self-reported “high levels” (i.e., usually or always) of teaching increased in six of the seven resident teaching items surveyed, with significant increases in two: “assessing the benefits of long-term opioid therapy” (57.1% to 76.2%, $P < 0.05$) and “interpreting abnormal urine drug tests” (38.1% to 57.1%, $P < 0.05$). In the remaining item, “monitoring for prescription opioid misuse,” those reporting “high levels” of teaching remained unchanged at 66.7%. The items with the greatest level of post-FDP “high-level” teaching were “identifying risk factors for opioid misuse” and “assessing the risks of long-term opioid therapy,” with both at 81.0%. The internal consistency was acceptable (Cronbach’s $\alpha = 0.74$).

Discussion

We describe the results of a safe opioid prescribing skills-based faculty development program provided for faculty preceptors of Internal Medicine residents that included a didactic presentation, followed by a four-station Observed Structured Clinical Examination. Our findings suggest this program resulted in improved safe opioid prescribing knowledge, attitudes, and confidence in the faculty preceptors’ clinical practice and their resident teaching. Over three months, their frequency of teaching residents safer opioid prescribing skills also improved but not significantly. The improvements we found can likely be explained by faculty learners having an opportunity to practice challenging patient communication skills and receive immediate feedback from faculty expert observers and standardized patients, allowing for modification and improvement of new skills.

Other faculty development interventions have demonstrated effectiveness in improving faculty opioid prescribing skills [29,45] and screening for at-risk substance use and substance use disorders (using screening, brief intervention, and referral to treatment [SBIRT]) [46]. However, these interventions have not shown improvements in teaching residents. For instance, Stone et al. [46] found that although faculty preceptors’ own SBIRT skills improved using a variety of teaching modalities, their self-reported teaching did not increase. Donovan et al. [29] showed improvement in faculty communication skills for managing patients with chronic pain using an online training program, but they did not evaluate changes in faculty teaching practices. Wong et al. [45] demonstrated post-FDP improvements in faculty confidence in teaching about office-based treatment of opioid use disorders, but they also did not measure faculty teaching practice. Our work expands on this background

literature by investigating whether this FDP would increase self-reported teaching confidence and practice using a structured, skills-based approach. This hypothesis was based on our previous study of Internal Medicine resident training, which showed that a didactic session followed immediately by skills practice using an OSCE was more effective than a didactic session alone or a didactic session followed by a delayed OSCE in improving residents' confidence and self-reported safer opioid prescribing practices [34].

Although our faculty preceptors felt significantly more confident in their ability to teach residents about safe opioid prescribing for chronic pain, this did not translate into significant increases in self-reported teaching. This may be due to the poor internal consistency in measurement of teaching confidence. It is also possible that three months was too short of a follow-up period to capture changes in teaching for a somewhat rare event—in this case, resident opioid prescribing for chronic pain. Although a longer study follow-up may allow for more opportunities to teach, a longer follow-up period may make it more difficult to attribute improved safe opioid prescribing teaching to the FDP as opposed to other influences (i.e., other related continuing medical education).

Our educational program evaluation has several limitations. The lack of a control group makes it difficult to attribute faculty improvements solely to our FDP. This could have been improved by having a comparison group and utilizing a waitlist control or a delayed-delivery model for part of the cohort; however, there were resource constraints (e.g., faculty schedules) that did not allow for this. Changes may have occurred due to outside influences such as the widely and continuously publicized increases in opioid-related deaths and national opioid prescribing guidelines. Generalizability of this intervention may be limited as our faculty participants self-selected to take this FDP and may have more interest in the topic of safe opioid prescribing than other faculty. Moreover, our faculty participants were already implementing many safe opioid prescribing practices (patient-provider agreements and urine drug testing) at a high level before the FDP, although this FDP was mostly focused on communication skills to improve the implementation of these safer opioid prescribing practices. Generalizability may also be limited by shortage of faculty experts in this content area to serve as OSCE expert observers. However, webcams have been shown to be as effective as in-person OSCEs in connecting expert faculty and learners from different institutions [47]. It is also possible that our self-reported data may overestimate post-FDP improvements due to social desirability bias with regards to safer opioid prescribing. However, participants were informed that surveys were collected and processed by an independent evaluator (BB) and that the data would be de-identified and aggregated before being made available to the program directors. Self-reported

data may also underestimate actual changes in teaching due to faculty being unaware of subtle changes in their clinical teaching. Finally, we do not have teaching data for 16% (4/25) of our faculty as three did not have opportunities to teach (did not precept residents treating patients with chronic opioids during the study period) and one did not answer the questions. This creates a selection bias that may have skewed our results away from the null, given that faculty participants who did not answer teaching questions or were not exposed to potential teaching encounters may have been less likely to teach at all. Lastly, evaluation of this FDP was not externally validated; however, we found overall acceptable internal validity and face validity.

Further FDP studies should evaluate the effect of faculty preceptor OSCE safer opioid prescribing training on resident (e.g., observed resident communication skills) and patient outcomes (e.g., patient understanding of opioid monitoring strategies), as these were not addressed in our study. It may be that self-reported confidence is not a valid or reliable outcome when measuring the effect of an educational intervention. Residents could comment on any perceived changes in their preceptors' teaching and consequent changes in their own clinical confidence and practice. Faculty teaching skills could be measured using resident-completed scoring cards [48]. Changes in post-FDP resident safe opioid prescribing practices could also be assessed via patient chart reviews, although this would not adequately capture changes in resident communication skills. Alternatively, resident- and patient-level outcomes could be assessed by postencounter patient interviews [49,50], by direct observation of resident practice [51], by repeat OSCEs with expert faculty observation for improvements [29], or through the use of unannounced standardized patients [52].

Our lack of significant increases in post-FDP preceptor resident teaching highlights the difficulty of translating clinical and teaching confidence into actual changes in teaching practice [48,53]. Incorporating safe opioid prescribing teaching skills into the FDP may improve subsequent teaching. A valuable next step would be developing and evaluating an Objective Structured Teaching Evaluation (OSTE) [54–56] in order to give faculty feedback on their safe opioid prescribing teaching skills. However, a systematic review [57] found that while OSTEs had generally positive qualitative reviews with regards to improving self-perceived teaching performance and interest in teaching, they had only moderate quantitative evidence as a faculty development tool. Finally, another potential next step could be co-training faculty and residents together, although this could lead to further logistical challenges (e.g., scheduling).

Conclusions

Overall, this study suggests that a skills-based FDP with a didactic session followed immediately by an OSCE

resulted in improved faculty preceptors' attitudes, knowledge, and confidence in clinical practice and teaching with regards to opioid prescribing for chronic pain. Further research is needed to elucidate the most effective strategies to improve and increase faculty teaching of safer opioid prescribing skills to residents.

References

1. Daubresse M, Chang HY, Yu Y, et al. Ambulatory diagnosis and treatment of nonmalignant pain in the United States, 2000-2010. *Med Care* 2013;51(10):870-8.
2. Dart RC, Surratt HL, Cicero TJ, et al. Trends in opioid analgesic abuse and mortality in the United States. *N Engl J Med* 2015;372(3):241-8.
3. Murthy VH. Ending the opioid epidemic—a call to action. *N Engl J Med* 2016;375(25):2413-5.
4. Committee on Pain Management and Regulatory Strategies to Address Prescription Opioid Abuse. Pain management and the opioid epidemic: Balancing societal and individual benefits and risks of prescription opioid use. In: Bonnie RJ, Ford MA, Phillips JK, eds. *A Consensus Study Report of the National Academies of Sciences, Engineering, and Medicine*. Washington, DC: The National Academies Press; 2017. p.57.
5. Institute of Medicine, Committee on Advancing Pain Research, Care, and Education. *Relieving Pain in America: A Blueprint for Transforming Prevention, Care, Education, and Research*. Washington, DC: National Academies Press; 2011. Available at: <https://www.ncbi.nlm.nih.gov/books/NBK92525/>. Accessed on March 11, 2018.
6. Barth KS, Guille C, McCauley J, Brady KT. Targeting practitioners: A review of guidelines, training, and policy in pain management. *Drug Alcohol Depend* 2017;173(suppl 1):S22-30.
7. Dowell D, Haegerich TM, Chou R. CDC guideline for prescribing opioids for chronic pain—United States, 2016. *MMWR Recomm Rep* 2016;65(1):1-49.
8. Nuckols TK, Anderson L, Popescu I, et al. Opioid prescribing: A systematic review and critical appraisal of guidelines for chronic pain. *Ann Intern Med* 2014;160(1):38-47.
9. Opioid Therapy for Chronic Pain Work Group. VA/DoD Clinical Practice Guideline for Opioid Therapy for Chronic Pain. 3rd ed. Department of Veterans Affairs and Department of Defense; 2017. Available at: <https://www.healthquality.va.gov/guidelines/Pain/cot/VADoDOTCPG022717.pdf> (accessed March 11 2017).
10. Chou R, Fanciullo GJ, Fine PG, et al. Clinical guidelines for the use of chronic opioid therapy in chronic noncancer pain. *J Pain* 2009;10(2):113-30.
11. Alford DP, Cohen ML, Reynolds EE. How would you manage opioid use in these three patients?: Grand rounds discussion from Beth Israel Deaconess Medical Center. *Ann Intern Med* 2017;166(7):506-13.
12. Merlin JS, Young SR, Starrels JL, et al. Managing concerning behaviors in patients prescribed opioids for chronic pain: A Delphi study. *J Gen Intern Med* 2018;33(2):166-76.
13. Matthias MS, Parpart AL, Nyland KA, et al. The patient-provider relationship in chronic pain care: Providers' perspectives. *Pain Med* 2010;11(11):1688-97.
14. Zeigler C, Mackey K, Hulen E, et al. Frontline account: Reducing the stress of pain management through the implementation of a controlled substance review group in a VA internal medicine residency clinic. *J Gen Intern Med* 2017;32(7):832-5.
15. Matthias MS, Krebs EE, Bergman AA, Coffing JM, Bair MJ. Communicating about opioids for chronic pain: A qualitative study of patient attributions and the influence of the patient-physician relationship. *Eur J Pain* 2014;18(6):835-43.
16. Starrels JL, Becker WC, Weiner MG, et al. Low use of opioid risk reduction strategies in primary care even for high risk patients with chronic pain. *J Gen Intern Med* 2011;26(9):958-64.
17. Sekhon R, Aminjavahery N, Davis CN Jr, Roswarski MJ, Robinette C. Compliance with opioid treatment guidelines for chronic non-cancer pain (CNCP) in primary care at a Veterans Affairs Medical Center (VAMC). *Pain Med* 2013;14(10):1548-56.
18. Khalid L, Liebschutz JM, Xuan Z, et al. Adherence to prescription opioid monitoring guidelines among residents and attending physicians in the primary care setting. *Pain Med* 2015;16(3):480-7.
19. Alford DP. Opioid prescribing for chronic pain—achieving the right balance through education. *N Engl J Med* 2016;374(4):301-3.
20. Gordon AJ, Harding JD Jr. From education to practice: Addressing opioid misuse through health care provider training: A special issue of Substance Abuse Journal. *Subst Abuse* 2017;38(2):119-21.
21. Chen JT, Fagan MJ, Diaz JA, Reinert SE. Is treating chronic pain torture? Internal medicine residents' experience with patients with chronic nonmalignant pain. *Teach Learn Med* 2007;19(2):101-5.
22. Starrels JL, Fox AD, Kunins HV, Cunningham CO. They don't know what they don't know: Internal medicine residents' knowledge and confidence in urine drug test interpretation for patients with chronic pain. *J Gen Intern Med* 2012;27(11):1521-7.
23. Yanni LM, Weaver MF, Johnson BA, et al. Management of chronic nonmalignant pain: A needs assessment in an internal medicine resident continuity clinic. *J Opioid Manag* 2008;4(4):201-11.
24. Webster F, Bremner S, Oosenbrug E, et al. From opioid phobia to overprescribing: A critical scoping review of medical education training for chronic pain. *Pain Med* 2017;18(8):1467-75.

25. Loeser JD, Schatman ME. Chronic pain management in medical education: A disastrous omission. *Postgrad Med* 2017;129(3):332–5.
26. Mezei L, Murinson BB. Pain education in North American medical schools. *J Pain* 2011;12(12):1199–208.
27. Alford DP, Zisblatt L, Ng P, et al. SCOPE of pain: An evaluation of an opioid risk evaluation and mitigation strategy continuing education program. *Pain Med* 2016;17(1):52–63.
28. Davis CS, Carr D. Physician continuing education to reduce opioid misuse, abuse, and overdose: Many opportunities, few requirements. *Drug Alcohol Depend* 2016;163:100–7.
29. Donovan AK, Wood GJ, Rubio DM, Day HD, Spagnoletti CL. Faculty communication knowledge, attitudes, and skills around chronic non-malignant pain improve with online training. *Pain Med* 2016;17(11):1985–92.
30. Cepeda MS, Coplan PM, Kopper NW, et al. ER/LA opioid analgesics REMS: Overview of ongoing assessments of its progress and its impact on health outcomes. *Pain Med* 2017;18(1):78–85.
31. Jain N, Mayahara M, Fox D, O'Mahony S. An educational intervention for internal medicine PGY-1 residents improves knowledge in principles of pain management and opioid safety (S790). *J Pain Symptom Manag* 2017;53(2):460.
32. Ruff AL, Alford DP, Butler R, Isaacson JH. Training internal medicine residents to manage chronic pain and prescription opioid misuse. *Subst Abus* 2017;38(2):200–4.
33. Smith CD. A curriculum to address family medicine residents' skills in treating patients with chronic pain. *Int J Psychiatry Med* 2014;47(4):327–36.
34. Alford DP, Carney BL, Brett B, Parish SJ, Jackson AH. Improving residents' safe opioid prescribing for chronic pain using an objective structured clinical examination. *J Grad Med Educ* 2016;8(3):390–7.
35. Sirovich BE, Lipner RS, Johnston M, Holmboe ES. The association between residency training and internists' ability to practice conservatively. *JAMA Intern Med* 2014;174(10):1640–8.
36. Delva MD, Schultz KW, Kirby JR, Godwin M. Ambulatory teaching: Do approaches to learning predict the site and preceptor characteristics valued by clerks and residents in the ambulatory setting? *BMC Med Educ* 2005;5(35):1–6.
37. Benbassat J. Role modeling in medical education: The importance of a reflective imitation. *Acad Med* 2014;89(4):550–4.
38. Cruess SR, Cruess RL, Steinert Y. Role modelling—making the most of a powerful teaching strategy. *BMJ* 2008;336(7646):718–21.
39. Long T, Chaiyachati K, Bosu O, et al. Why aren't more primary care residents going into primary care? A qualitative study. *J Gen Intern Med* 2016;31(12):1452–9.
40. Parish SJ, Ramaswamy M, Stein MR, Kachur EK, Arnsten JH. Teaching about substance abuse with objective structured clinical exams. *J Gen Intern Med* 2006;21(5):453–9.
41. Nicolaidis C. Police officer, deal-maker, or health care provider? Moving to a patient-centered framework for chronic opioid management. *Pain Med* 2011;12(6):890–7.
42. Gourlay DL, Heit HA, Almahrezi A. Universal precautions in pain medicine: A rational approach to the treatment of chronic pain. *Pain Med* 2005;6(2):107–12.
43. Manson JE, Kaunitz AM. Menopause management—getting clinical care back on track. *N Engl J Med* 2016;374(9):803–6.
44. SAS/STAT. SAS System for Microsoft Windows [computer program]. 9.4 ed. Cary, NC: SAS Institute Inc; 2002–2012.
45. Wong JG, Holmboe ES, Jara GB, et al. Faculty development in small-group teaching skills associated with a training course on office-based treatment of opioid dependence. *Subst Abus* 2005;25(4):35–40.
46. Stone A, Wamsley M, O'Sullivan P, et al. Faculty development efforts to promote screening, brief intervention, and referral to treatment (SBIRT) in an internal medicine faculty-resident practice. *Subst Abus* 2017;38(1):31–4.
47. Chan J, Humphrey-Murto S, Pugh DM, Su C, Wood T. The objective structured clinical examination: Can physician-examiners participate from a distance? *Med Educ* 2014;48(4):441–50.
48. Eckstrom E, Homer L, Bowen JL. Measuring outcomes of a one-minute preceptor faculty development workshop. *J Gen Intern Med* 2006;21(5):410–4.
49. Newcomb A, Trickey AW, Lita E, Dort J. Evaluating surgical residents' patient-centered communication skills: Practical alternatives to the “apprenticeship model”. *J Surg Educ* 2018; 75(3): 613–21.
50. Saitz R, Horton NJ, Cheng DM, Samet JH. Alcohol counseling reflects higher quality of primary care. *J Gen Intern Med* 2008;23(9):1482–6.
51. Holmboe ES, Hawkins RE, Huot SJ. Effects of training in direct observation of medical residents' clinical competence: A randomized trial. *Ann Intern Med* 2004;140(11):874–81.
52. Siminoff LA, Rogers HL, Waller AC, et al. The advantages and challenges of unannounced standardized patient methodology to assess healthcare communication. *Patient Educ Couns* 2011;82(3):318–24.
53. Mukerji G, Weinerman A, Schwartz S, et al. Communicating wisely: Teaching residents to communicate effectively with patients and caregivers about unnecessary tests. *BMC Med Educ* 2017;17(1):248.

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54. Prislin MD, Fitzpatrick C, Giglio M, Lie D, Radecki S. Initial experience with a multi-station objective structured teaching skills evaluation. *Acad Med* 1998;73(10):1116–8.
  55. Simpson DE, Lawrence SL, Krogull SR. Using standardized ambulatory teaching situations for faculty development. *Teach Learn Med* 1992;4(1):58–61.
  56. Julian K, Appelle N, O’Sullivan P, Morrison EH, Wamsley M. The impact of an objective structured teaching evaluation on faculty teaching skills. *Teach Learn Med* 2012;24(1):3–7.
  57. Trowbridge RL, Snyderman LK, Skolfield J, Hafler J, Bing-You RG. A systematic review of the use and effectiveness of the objective structured teaching encounter. *Med Teach* 2011;33(11):893–903.