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**Impact of Continuing Education in Reducing Perceived Challenges to Treating Patients Co-
Prescribed Opioids and Benzodiazepines Among Midwest Clinicians**

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Abstract

Goal

The goal of this Capstone project was to provide meaningful Continuing Education (CE) to clinicians in the Midwest to reduce perceived challenges to safely treating patients co-prescribed opioid analgesics and benzodiazepines

Objectives

Using continuing education, increase clinician knowledge of effective alternative non-opioid and non-benzodiazepine therapies for chronic conditions while increasing clinician comfort in tapering patients off opioid analgesics and benzodiazepines

Methods

A one-hour CE presentation was prepared with the assistance of the Nebraska Department of Health and Human Services (NeDHHS) and broadcast to clinicians in the Midwest through a live webinar in coordination with the Great Plains Quality Innovation Network (GPQIN) and the Nebraska Medical Association (NMA). Clinicians registering for the webinar included physicians, mid-level providers such as physician assistants and nurse practitioners, pharmacists, and nurses. In the process of registering for the webinar, clinicians were required to answer five questions to assess their perceived knowledge of effective alternative non-opioid and non-benzodiazepine therapies and their comfort with tapering patients off opioid analgesics and benzodiazepines. After the webinar, providers were required to complete a post-assessment survey of identical questions to obtain their CE credit. These questions were arranged on a 5-

point Likert scale describing their level of agreement with the statements posed. Post-webinar responses were compared to the pre-webinar responses to examine the effect of the CE presentation on provider knowledge and comfort in treating patients prescribed both opioids and benzodiazepines. The Wilcoxon signed-rank test was used to compare the pre- and post-webinar responses to determine if the CE presentation was associated with a difference in self-reported knowledge and comfort in guideline recommended practices.

Project Impact

This study demonstrated that continuing education was associated with a statistically significant increase in self-reported clinician knowledge of effective alternative non-opioid and non-benzodiazepine therapies for chronic conditions while also increasing self-reported clinician comfort in tapering patients off opioid analgesics and benzodiazepines. State health departments should promote the use of CE in reducing perceived challenges to safely treating patients co-prescribed opioid analgesics and benzodiazepines in their efforts to decrease the incidence of opioid-related overdose deaths.

Introduction

The rate of drug overdose death in the United States increased significantly from 6 per 100,000 population in 1999 to 13.8 per 100,000 in 2013 (Paulozzi, 2015). This increase is largely attributed to drug overdose deaths involving prescription opioid analgesics (Paulozzi, 2015). Commonly prescribed for the treatment of moderate to severe pain, opioid analgesics can cause serious adverse events such as potentially fatal respiratory depression at higher doses (Dowell, 2016). The rate of opioid-related overdose deaths nearly quadrupled from 1.4 per 100,000 population in 1999 to 5.4 per 100,000 in 2011 (Chen, 2014). More than 165,000 people died of opioid-related overdose between 1999 to 2014 (Dowell, 2016). In 2013 alone, about 1.9 million people either abused or were dependent on opioid therapies (Dowell, 2016). On average, 115 Americans die from an opioid-related overdose every day (Hedegaard, 2017).

Benzodiazepines, a class of sedatives used for the treatment of anxiety and other disorders, can increase the risk of overdose when used in combination with opioid therapies. An increase in opioid overdoses involving benzodiazepines has been associated with a portion of the increased rate of drug overdoses observed over the past decade (Chen, 2014). In 2011, benzodiazepines were involved in 31% of opioid-related overdose deaths, up from 13% of opioid-related deaths in 1999 (Chen, 2014). The rate of emergency room visits involving both opioid therapies and benzodiazepines increased from 11 per 100,000 population in 2004 to 34.2 per 100,000 in 2011 (Jones, 2015). During this same period, drug overdose deaths involving the combination of these therapies increased from 0.6 per 100,000 population to 1.7 per 100,000 (Jones, 2015). Recent statewide studies have found benzodiazepines to be involved in 68.4% of prescription opioid-related deaths in New York City, while the rate of overdose

death in North Carolina was ten times higher for patients co-prescribed opioids and benzodiazepines versus opioids alone (Sgarlato, 2015; Dasgupta, 2016). In 2016, the U.S. Food and Drug Administration (FDA) required updated labeling of benzodiazepines to warn health care providers and patients about the serious risks associated with their use when combined with opioids therapies (FDA, 2016).

In addition to being at an increased risk of overdose and death, patients prescribed benzodiazepines in combination with opioids have been found to exhibit poorer outcomes in the treatment of chronic pain compared to patients receiving only opioids. Specifically, patients taking opioids for chronic pain received opioids for a longer duration if they were also prescribed benzodiazepines (Jones, 2015). Additionally, patients who received both opioids and benzodiazepines were more likely to have a history of substance use disorder and depression (Jones, 2015). Patients receiving low doses of opioid therapies are still at an increased risk when taken concurrently with benzodiazepines. Among Washington Medicaid recipients, patients receiving doses as low as 1-19 milligram equivalents of morphine per day in combination with sedatives, such as benzodiazepines, had 5.6 times the risk of opioid overdose compared to those not receiving sedatives (Garg, 2017). These observed increases in morbidity and mortality suggest the need to create initiatives aimed at decreasing the concurrent use of opioids and benzodiazepines. Studies have shown the risk of emergency room visits and inpatient admissions related to opioid use could be reduced by an estimated 15% by eliminating the combined use of these two therapies (Sun, 2017).

In 2016, the Center for Disease Control and Prevention (CDC) published guidelines for prescribing opioids for chronic pain in the *Journal of the American Medical Association* (Dowell,

2016). These guidelines list non-opioid therapies as the preferred treatment of chronic pain and recommend opioids be used only when the benefits for pain and function are expected to outweigh their risks (Dowell, 2016). These guidelines explicitly state to avoid the concomitant use of opioids and benzodiazepines whenever possible (Dowell, 2016). Recommendations to arrange evidence-based treatment such as medication assisted treatment (MAT) for patients with opioid use disorder are also provided (Dowell, 2016). Several states have also developed their own guidelines and enacted programs in an attempt to reduce opioid-related overdose deaths. In 2011, more than 70 local healthcare professionals in Oregon formed the Oregon Pain Guidance (OPG) group. The OPG group, comprised of nurses, prescribers, pharmacists, and behavioral health clinicians, meets monthly to update and encourage the use of their own pain guidance document. The goal of the Oregon Pain Guidance Document is to reduce the morbidity and mortality associated with the misuse of opioids while increasing focus on non-opioid treatments (OPG, 2014). In Washington, an advisory group of state academic leaders, pain experts, and clinicians developed the Washington State Agency Medical Directors' Group's (AMDG) Interagency Opioid Guideline in 2007. The guideline is currently on its third edition after updates in 2010 and most recently in 2015. This guideline provides a "balanced approach to pain management that includes recommendations for using opioids when appropriate, such as with acute injuries and flare ups, for postoperative pain management, and during pain procedures; and recommending multimodal therapies in general for all chronic pain patients" (AMDG, 2015). Since inception of the AMDG guideline and other statewide efforts in Washington, the rate of prescription opioid-related deaths decreased by 29% from 2008 and 2013, with hospitalizations for prescription opioid overdose also declining by 29% between

2011 and 2013 (AMDG, 2015). Both the Oregon Pain Guidance Document and the AMDG Interagency Guideline caution against the co-prescribing of opioids and benzodiazepines while offering specific guidance on safely tapering these therapies when appropriate.

The Nebraska Department of Health and Human Services (NeDHHS) has worked with several stakeholders to promote safe opioid practices. The NeDHHS Division of Public Health, which is responsible for preventive and community health services, regulates and licenses health-related professions and occupations, among other responsibilities. In October of 2017, the NeDHHS published the Nebraska Pain Management Guidance Document in collaboration with an expert advisory task force, active providers, and state officials (NeDHHS, 2017). This document, which resembles the Oregon Pain Guidance Document, included several of the CDC recommendations for opioid therapies, along with several additional resources for treating patients who are receiving concurrent benzodiazepine and opioids (NeDHHS, 2017). The guideline recommends patients receiving opioids be screened for benzodiazepine use upon intake and to offer naloxone to all patients of high risk, such as those receiving concomitant benzodiazepines and opioids (NeDHHS, 2017). Specific regimens are listed to help taper patients off their benzodiazepine and/or opioid with specific tools and considerations provided (NeDHHS, 2017). Additionally, the guideline recommends that patients refusing to dose reduce their opioid and benzodiazepine should be referred to pain specialty care (NeDHHS, 2017).

Despite a strong agreement with federal and state clinical practice guidelines, providers have reported several barriers contributing to continued co-prescribing of opioids and benzodiazepines (Hawkins, 2017). In a study surveying primary care and mental health prescribers, 40% of providers indicated that co-prescribing opioids and benzodiazepines

continues because patients appear stable on therapy and tapering is too difficult (Hawkins, 2017). Other barriers listed include the difficulty of addressing patients who refuse to discontinue treatment (Hawkins, 2017). Furthermore, tapering patients off benzodiazepines is a difficult process. The traditional approach is to provide a slow dose reduction of 5% to 25% every 1 to 4 weeks until the benzodiazepine is discontinued (Ogbonna, 2017). During the taper process, patients may experience several withdrawal symptoms, such as dizziness, recurrence of severe anxiety, insomnia, and other bodily symptoms (Lader, 2016). If the patient's benzodiazepine is immediately discontinued without a taper, they are at risk of experiencing life-threatening convulsions (Lader, 2016). Evidence to support non-pharmacologic and pharmacologic therapies to aid patients in tapering benzodiazepines is based on expert opinion and low-quality evidence (Baandrup, 2018). Tapering opioids is also a difficult process for patients and providers. Tapering opioids can take weeks to months, depending on the dose and duration of their opioid therapy. Patients may experience widespread opioid withdrawal symptoms and are at an increased risk for self-harm and suicide while tapering (Moss, 2019). Similar to tapering benzodiazepines, guidelines do not include evidence-based practices for opioid discontinuation, but rather provide best practices based on expert opinion (Berna, 2015).

A survey was distributed to Nebraska physicians in coordination with the Nebraska Medical Association in February 2019 to assess current challenges to treating patients prescribed opioid and benzodiazepines. There were 79 total physicians who responded to the survey, 43.6% of which identified their specialty as Family Medicine and 71.1% of which self-identified as practicing in an urban setting (defined as a city of greater than 50,000 people). This

survey and its results are listed in Appendices A and B, respectively. Several respondents agreed that certain barriers contribute to patients remaining on concomitant opioids and benzodiazepines. A majority (63.3%) of respondents agreed or strongly agreed that patients appear stable on these medications with no adverse effects. An identical majority (63.3%) of respondents also agreed or strongly agreed that it is difficult to coordinate with other prescribers to taper therapies. However, only 26.6% of respondents agreed or strongly agreed that the benefits of concomitant opioids and benzodiazepines appear to exceed the risks. Several respondents indicated there are limited alternative treatments for anxiety and pain and a lack of practical methods for tapering opioids and benzodiazepines. In free response sections of the survey, respondents stated they frequently meet resistance from patients unwilling to taper, withdrawal symptoms are a significant barrier to tapering, and patients often dropout of care during the taper process and seek opioids or benzodiazepines from other providers. Respondents noted they would like information on discussing the topic of tapering with patients and would like to know of additional evidence-based non-opioid therapies for the treatment of pain and non-benzodiazepine therapies for the treatment of mental health disorders such as anxiety and insomnia.

Given the increased involvement of benzodiazepines in opioid-related deaths and the reported challenges contributing to their continued concurrent use, targeted education to clinicians on best practices in tapering opioids and benzodiazepines and guideline recommended treatment alternatives for chronic pain and mental health disorders is necessary. This study seeks to determine if a one-hour CE presentation, prepared in coordination with the

NeDHHS, is associated with a difference in self-reported knowledge and comfort in guideline recommended practices.

Methods

Research Question:

Can one hour of CE provide meaningful education to clinicians in the Midwest United States to reduce the perceived challenges of safely treating patients prescribed opioids and benzodiazepines?

Application of Theoretical Models

Theories used to create an effective CE presentation will be based on the Elaboration Likelihood Model (ELM). This theory of persuasive communication assumes that people differ in their abilities and motivation for thoughtful information processing and aims to change attitudes with logic, reasoning, and effective communication (Bartholomew, 2016). In this model, successful communication is key to gain the attention of providers and convey the message being presented (Bartholomew, 2016). The method of active processing was utilized with survey questions before and after the live webinar (Bartholomew, 2016). Strong arguments were created for the avoidance of concomitant opioid and benzodiazepine prescribing. To create a strong argument, the presentation repeatedly framed co-prescribing opioids and benzodiazepines as an undesirable outcome to avoid while conveying a causal relationship between co-prescribing and increased morbidity and mortality (Bartholomew, 2016). Recommendations were applicable and feasible to current practice, relevant to patient safety, and unique from previous arguments (Bartholomew, 2016). An additional method to

improve information processing was to create a recorded, on-demand presentation posted on the NMA website that will allow self-pacing.

Study Design

A one-hour CE presentation prepared with the assistance of the NeDHHS was broadcast to clinicians in the Midwest through a live webinar in coordination with the Great Plains Quality Innovation Network (GPQIN) and the Nebraska Medical Association (NMA). In the process of registering for the webinar, clinicians were required to answer five pre-webinar questions to assess their perceived knowledge of effective alternative non-opioid and non-benzodiazepine therapies and their comfort with tapering patients off opioid analgesics and benzodiazepines. The pre-webinar questions also surveyed if prescribers utilized assessment tools and Prescription Drug Monitoring Program (PDMP) data when prescribing opioids or benzodiazepines for long term use. The PowerPoint slides used for this live webinar event can be found in Appendix C. The objectives of the live webinar were the following:

1. Discuss the morbidity and mortality associated with concomitant opioid and benzodiazepine therapy
2. Summarize the evidence to support therapies for the treatment of anxiety, insomnia, and pain
3. Evaluate strategies for tapering opioid analgesics and benzodiazepines
4. Discuss strategies to engage patients in difficult conversations and outline appropriate patient selection for referral to specialty care

After the webinar, providers were required to complete a post-webinar survey of questions identical to the pre-webinar survey to obtain their CE credit. The questions included in the pre- and post-webinar surveys were arranged on a 5-point Likert scale describing their level of agreement with the statements posed. These questions are listed below in Figure 1.

Figure 1: Pre- and Post-Webinar Survey Questions

Please select the option that best describes your level of agreement with the statement
1. I am knowledgeable of effective non-opioid therapies to treat chronic pain. a. Strongly Disagree b. Disagree c. Neither Disagree or Agree d. Agree e. Strongly Agree
2. I am knowledgeable of effective non-benzodiazepine therapies to treat anxiety disorders. a. Strongly Disagree b. Disagree c. Neither Disagree or Agree d. Agree e. Strongly Agree
3. I feel comfortable tapering my patients off opioid therapies a. Strongly Disagree b. Disagree c. Neither Disagree or Agree d. Agree e. Strongly Agree
4. I feel comfortable tapering my patients off benzodiazepine therapies a. Strongly Disagree b. Disagree c. Neither Disagree or Agree d. Agree e. Strongly Agree
5. I utilize assessment tools and Prescription Drug Monitoring Program (PDMP) data to evaluate the risk of medication misuse when prescribing opioids or benzodiazepines for long term use. a. Strongly Disagree b. Disagree c. Neither Disagree or Agree d. Agree e. Strongly Agree
In the post-webinar survey, the format of question 5 was changed to the following:
5. Going forward, I will utilize assessment tools and Prescription Drug Monitoring Program (PDMP) data to evaluate the risk of medication misuse when prescribing opioids or benzodiazepines for long term use. a. Strongly Disagree b. Disagree c. Neither Disagree or Agree d. Agree e. Strongly Agree

Study Population and sample size

The target population were Midwest clinicians including physicians, mid-level prescribers such as physician assistants and nurse practitioners, pharmacists, and nurses. A total of 131 clinicians registered for the live webinar, including clinicians in states outside of the

Midwest (e.g., Rhode Island, New Jersey, etc.). A total of 31 clinicians completed the post-webinar assessment per protocol and were included in the study sample and statistical analysis. See Table 1 for baseline characteristics of the study sample and Figure 2 for inclusion of clinicians in the study sample.

Data source and collection methods

Up to one month prior to viewing the live CE webinar, clinicians were required to submit responses to pre-webinar survey questions during the registration process. These responses were submitted through a third-party company and delivered to the GPQIN within 7 days following the live webinar. Clinicians were then required to provide responses to post-webinar survey questions after the event in order to attain their CE credit (see Figure 1 for pre- and post-webinar survey questions). These post-webinar responses were submitted directly to the GPQIN through the application SurveyMonkey.

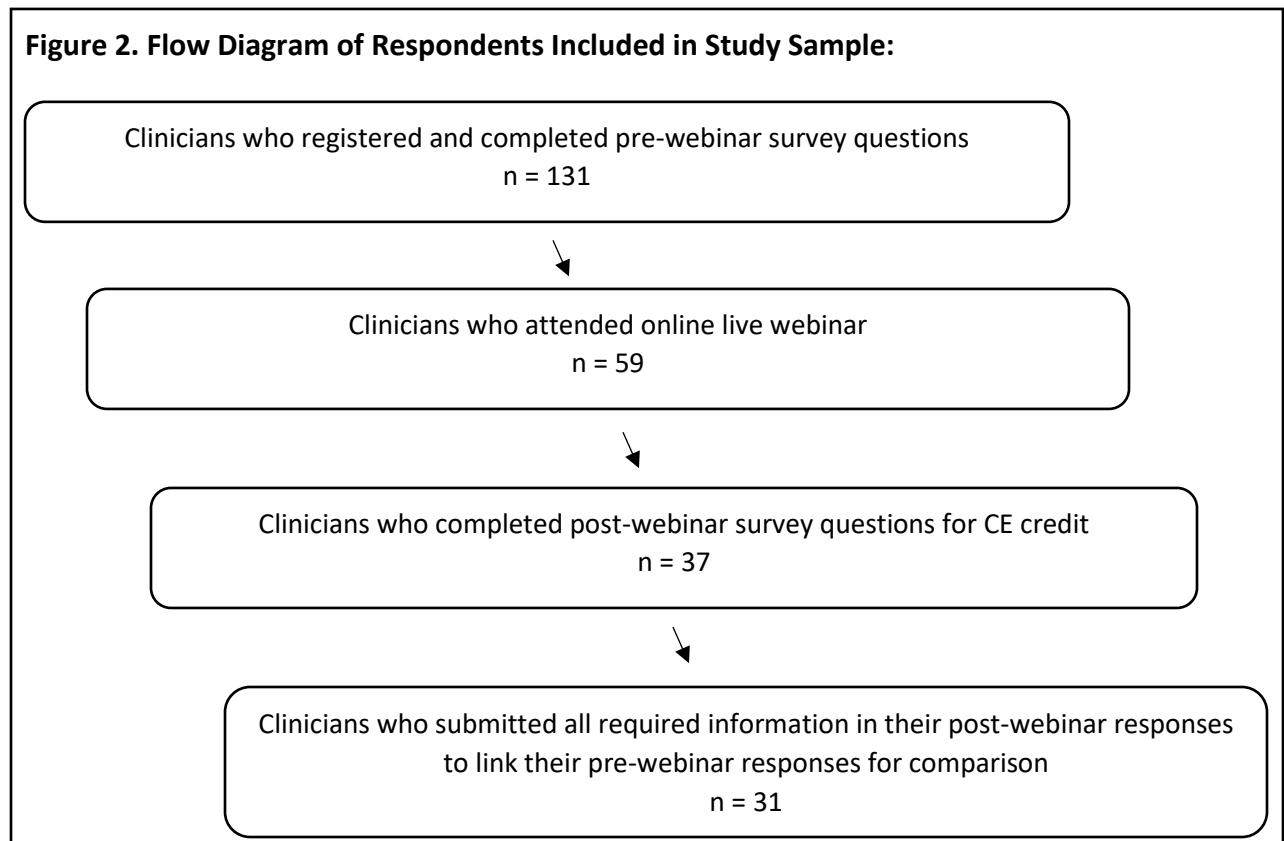
Statistical methods

Post-webinar responses were compared to pre-webinar responses to examine the effect of the CE presentation on provider knowledge and comfort in treating patients prescribed both opioids and benzodiazepines. As detailed in Figure 1, responses were provided on a 5-point Likert scale from Strongly Disagree to Strongly Agree. For the purpose of this study, responses were changed to a scale of 1 (Strongly Disagree) to 5 (Strongly Agree). Due to the ordinal nature of Likert scale data collected among paired groups, the nonparametric Wilcoxon signed-rank test ($\alpha = 0.05$) using XLSTAT software in Microsoft Excel was used to compare the pre- and post-webinar responses to determine if the CE presentation was associated with a statistically

significant difference in responses. A secondary analysis was completed among prescribers only (i.e., physicians, nurse practitioners, and physician assistants) using the same statistical methods.

Results

A total of 131 clinicians registered for the CE webinar and submitted pre-webinar survey questions. Of those who registered, only 59 clinicians were documented as attending the online live CE webinar, and 37 clinicians at least partially completed post-webinar survey questions. Only 31 clinicians fully completed the post-webinar survey questions and included the information necessary to link their post-webinar responses to their pre-webinar responses. These 31 clinicians were included in the per protocol study sample and statistical analysis. See Figure 2 for the Flow Diagram of study sample inclusion.



Demographic data of respondents in the per protocol study sample is listed in Table 1.

There were 12 prescribers (i.e., physicians, physician assistants, nurse practitioner), 5 pharmacists, 12 nurses, and 2 other clinicians included in the study sample. While the majority (74.2%) of respondents practiced in Nebraska, the study sample included respondents from several other states in and outside of the Midwest. A majority (64.5%) of respondents practiced in rural areas, defined as a city less than 50,000 total population as of the 2010 census while not being part of a greater metropolitan area.

Table 1. Demographics of Respondents in Study Sample

Characteristic	N	n (%)
Clinician Type		
Physician	5	16.1
Physician Assistant	4	12.9
Nurse Practitioner	3	9.7
Pharmacist	5	16.1
Nursing	12	38.7
Other	2	6.5
State		
Illinois	1	3.2
Kansas	2	6.5
Nebraska	23	74.2
New Jersey	1	3.2
Oklahoma	1	3.2
Rhode Island	2	6.5
South Dakota	1	3.2
Urban or Rural*		
Urban	11	35.5
Rural	20	64.5

* Rural defined as city less than 50,000 population as of 2010 census and not part of a greater metropolitan area

Several respondents submitted higher scores in their post-webinar responses in comparison to their pre-webinar responses. The mean pre- and post-webinar responses in the study sample, along with the associated p-values, are listed in Table 2. There was an increase in the mean post-webinar response scores when compared to the mean pre-webinar responses for all five survey questions. The associated increase in survey response scores between pre- and post-survey questions were all statistically significant (p-value < 0.05). A complete table of the responses submitted, along with associated demographic information, can be found in Appendix D.

Table 2. Difference in Pre- and Post-Webinar Responses in Study Sample (n = 31)

	Question	Pre-Webinar Mean	Post-Webinar Mean	p-value
1	I am knowledgeable of effective non-opioid therapies to treat chronic pain.	3.97	4.29	0.025*
2	I am knowledgeable of effective non-benzodiazepine therapies to treat anxiety disorders.	3.55	4.26	0.001*
3	I feel comfortable tapering my patients off opioid therapies.	3.45	4.10	0.016*
4	I feel comfortable tapering my patients off benzodiazepine therapies.	3.42	4.07	0.011*
5	[Going forward,] I [will] utilize assessment tools and Prescription Drug Monitoring Program (PDMP) data to evaluate the risk of medication misuse when prescribing opioids or benzodiazepines for long term use.	3.55	4.39	0.002*

*Statistically significant difference in question response with alpha = 0.05

Not all questions included in the pre- and post-webinar surveys apply to clinicians that do not regularly prescribe therapies. For instance, questioning a nurse or pharmacist if they feel

comfortable tapering opioids and benzodiazepines may not be appropriate. Therefore, a secondary analysis was performed among the clinicians in the study sample who regularly prescribe medications (i.e., physicians, physician assistants, nurse practitioners). There were 12 total prescribers included in this analysis. The mean pre- and post-webinar responses in this study sample, along with the associated p-values, are listed in Table 3. While several prescribers listed higher scores in the post-webinar responses compared to the pre-webinar responses, this increase was not found to be statistically significant for 4 out of 5 of the questions. There was a statistically significant increase in response scores for the survey question on perceived knowledge of effective non-benzodiazepine therapies for the treatment of anxiety disorders in this secondary analysis.

Table 3. Difference in Pre- and Post-Webinar Responses Among Prescribers in Study Sample (n = 12)

Question Number	Question	Pre-Webinar Mean	Post-Webinar Mean	p-value
1	I am knowledgeable of effective non-opioid therapies to treat chronic pain.	4.17	4.33	0.414
2	I am knowledgeable of effective non-benzodiazepine therapies to treat anxiety disorders.	3.33	4.33	0.018*
3	I feel comfortable tapering my patients off opioid therapies.	3.83	4.25	0.265
4	I feel comfortable tapering my patients off benzodiazepine therapies.	3.83	4.17	0.331
5	[Going forward,] I [will] utilize assessment tools and Prescription Drug Monitoring Program (PDMP) data to evaluate the risk of medication misuse when prescribing opioids or benzodiazepines for long term use.	3.58	4.33	0.133

*Statistically significant difference in question response with alpha = 0.05

Discussion

In previous needs assessments, clinicians have indicated that a lack of effective non-opioid and non-benzodiazepine therapies have contributed to patients remaining on co-prescribed opioids and benzodiazepines. Clinicians have also previously indicated that there is a lack of guidance on appropriate and evidenced-based tapering methods for patients prescribed these therapies. This CE webinar was constructed based on the results of these needs assessments to provide clinicians with the information necessary to improve their knowledge of alternative therapies used to treat pain and mental health disorders while providing tools and recommended practices to assist in tapering opioids and benzodiazepines. This study demonstrates that a one-hour CE webinar was associated with a statistically significant difference among clinicians in self-reported comfort in tapering patients off opioids and benzodiazepines and knowledge in treating patients with alternative therapies.

In the secondary analysis, only prescriber responses (n=12) were compared to detect if there was a difference in pre- and post-webinar responses. While we found a statistically significant difference in reported knowledge of effective non-benzodiazepine therapies to treat anxiety disorders and a trend of increased mean survey responses for the other survey questions, we did not find statistically significant differences in 4 out of 5 of the survey questions. This may be due to higher mean response scores in the pre-webinar responses, as the prescriber group may have a higher baseline knowledge of these topics when compared to the average clinician in the non-prescribing group. It may also be due to the decrease in sample size, making it difficult to detect a statistically significant difference given the relatively small

effect size. Future analyses of the effectiveness of CE presentations should seek to include a higher number of prescribers to increase study power.

In the current opioid epidemic, clinicians have faced increased scrutiny over their opioid and benzodiazepine prescribing habits. Several states have mandated certain prescribing practices when treating patients with opioid analgesics. Several health plans and pharmacy benefit managers have also enacted clinical and drug utilization review (DUR) programs limiting opioid prescribing. Physicians have voiced their frustration over mandated forced opioid tapering due to limits imposed by these state regulations and clinical programs (Darnall, 2019). While the benefits of chronic opioids and benzodiazepines often do not outweigh their risks, tapering these therapies can be associated with risks of their own (Moss, 2019). Education to clinicians in the form of CE may offer a solution to state agencies searching for programs aimed at improving prescribing habits without mandating potentially dangerous prescribing practices.

As discussed earlier, there is substantial data to suggest that the increased use of benzodiazepines in combination with opioids is associated with a portion of the increase in opioid related deaths. Efforts to decrease opioid overdose deaths should continue to focus on promoting non-benzodiazepine therapies and non-pharmacologic therapies for the treatment of mental health disorders. Future studies should investigate the benefit in providing clinicians with CE presentations that include tools to engage patients in the difficult discussion of tapering. While these discussions are critical to tapering efficacy, and while the CE presentation included recommendations for engaging patients in these difficult discussions, this study did not directly measure if providers found this type of information helpful. As future clinical trials are completed on evidenced-based treatments to taper patients off opioids and

benzodiazepines, these protocols should be shared with clinicians in the form of CE as current guidelines for tapering these therapies are largely based on expert opinion. State health departments should continue to promote the use of assessment tools and PDMP's as these tools and programs continue to be underutilized in practice based on needs assessment responses and the pre-webinar responses in this study.

In the process of creating the CE presentation for this study, there was substantial evidence found to suggest the benefit in medication assisted treatment (MAT) in patients suffering from opioid use disorder (Chen, 2014). Non-pharmacologic treatments such as counseling for mental health disorders were also found to have additive benefit in patients prescribed medications for depression and anxiety (Locke, 2015). Unfortunately, there are not enough prescribers and facilities to provide these services in many areas, especially in rural Nebraska. State and federal agencies should investigate innovative strategies to decrease this gap in care, such as condensing requirements for XDEA registration required to prescribe medications in MAT, promoting virtual behavioral health visits, or promoting cognitive behavioral therapy in primary care. State health departments can work with their opioid task forces and related provider groups to create patient handouts, providers tools, and CE programs to assist in opioid and benzodiazepine tapering and safe evidence-based treatment recommendations for pain and mental health disorders.

Study Limitations

The results of this study were based on subjective responses rather than objective prescription or clinical outcomes data. Results of this study may not reflect real world changes to prescribing practices. Most clinicians included in this study were from Nebraska and rural areas. Future studies should include a greater number of clinicians from across the United States to improve the generalizability of these results. As noted previously, this study asked non-prescribing clinicians on their comfort in tapering patients on opioids and benzodiazepines, which may have not been appropriate. Future studies should increase the number of prescribers in their analysis and only ask questions applicable to each clinician's practice.

Conclusions

Continuing education was associated with a statistically significant increase in self-reported clinician knowledge of effective alternative non-opioid and non-benzodiazepine therapies for chronic conditions while also increasing self-reported clinician comfort in tapering patients off opioid analgesics and benzodiazepines. State health departments should promote the use of CE in reducing perceived challenges to safely treating patients co-prescribed opioid analgesics and benzodiazepines in their efforts to decrease the incidence of opioid-related overdose.

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Service Learning/Capstone Experience Reflection

The Nebraska Department of Health and Human Services consists of several different divisions. During my Service Learning experience, I worked specifically with individuals within the division of Public Health. This division has several responsibilities, such as regulation and licensure of health professionals and healthcare facilities, and various community health programs and services. During my on-site visit, I had the opportunity to discuss several ongoing projects, such as the Pain Guidance document, the new Prescription Drug Monitoring Program (PDMP), and the drug overdose prevention efforts involving naloxone. I learned that the department works heavily with stakeholders in the community, such as the Nebraska Medical Association and various physicians and pharmacists. The department was also in tune with pending legislative bills with the potential of significantly impacting their work. Throughout the Service Learning and Capstone experience, we utilized their network of subject matter experts while leveraging pending legislation to facilitate the success of our initiatives.

In October of 2017, I began working with the NeDHHS after connecting with Amy Reynoldson. Through communication over email and phone, we discussed the requirements of the Service Learning and Capstone project, as well as ongoing applicable projects at the division of public health. During my visit at the NeDHHS in Lincoln, I narrowed the focus of my project to the new Nebraska Pain Guidance document and its recommendation to discourage concomitant opioid and benzodiazepine use. Amy introduced me to Dale Mahlman, the Executive Vice President of the Nebraska Medical Association (NMA). In January of 2018, I had the opportunity to meet Dale in person at the NMA and discuss how we would incorporate the

capabilities and network of the NMA into discouraging the co-prescribing of opioids and benzodiazepines among Nebraska physicians.

After deciding on an appropriate topic for the Service Learning and Capstone project, I met with Dr. Nizar Wehbi at UNMC to discuss the course requirements while narrowing the scope of the projects so that they were measurable and achievable within the timeframe of the course. After meeting with Dr. Wehbi, I began to put together the project proposal and worked with Amy to ensure that the NeDHHS and NMA could accommodate our vision. We decided that I would create a CE presentation accredited by the NMA targeted towards Nebraska physicians. We discussed the importance of conducting a needs assessment survey prior to the CE presentation to ensure that we were providing education that was applicable to Nebraska physicians. This survey would assess the specific challenges that Nebraska physicians face that allow the concomitant use of opioids and benzodiazepine therapies to persist. After a literature review of previous surveys in the United States, a draft of the needs assessment was created and reviewed with Amy. In February, I met with Dale Mahlman and Dr. John Massey, the Task Force Chair of the NeDHHS Pain Guidance Document, to discuss the project and needs assessment survey. In March, I was invited back to the NMA to share the needs assessment with the Pain Management Task Force during their scheduled evening meeting to solicit additional feedback. After incorporating their recommendations into the need's assessment, a project proposal meeting was held with Dr. Wehbi and Amy at UNMC to solidify expectations for the Service Learning and Capstone course. The project proposal was approved after receiving confirmation from Gail Kotulak, an IRB Administrator at UNMC, that the project would not require IRB approval.

I had the opportunity to meet several other providers from a variety of healthcare settings to receive additional feedback on the needs assessment survey. In April, I met with Dr. Thomas Tape, Chief of the UNMC Division of General Internal Medicine, and Dr. Ann Polich, Vice President of Quality and Performance Improvement at Methodist Health System, to discuss the needs assessment survey while receiving their unique perspectives on opioid treatment. Afterwards, I met with Jeff Huether and Clint Williams at Blue Cross Blue Shield of Nebraska to discuss initiatives that local health plans were taking to address the opioid epidemic. After receiving feedback from multiple stakeholders, it was decided that the most efficient way of sending the needs assessment survey would be through an electronic platform via email. After researching several different survey platforms, we decided to utilize Google forms for our needs assessment.

In the summer of 2018, Amy took on a new position as the new Executive Vice President of the NMA ahead of Dale Mahlman's retirement in January 2019. I was fortunate enough to have Ashley Newmyer, Deputy Director at the NeDHHS Division of Public Health, step in as the new preceptor for my Capstone project. After receiving additional feedback from Jeff Armitage at the NeDHHS on my survey, I reconciled all stakeholder input to create the final needs assessment survey with Google forms. The final survey included 15 total questions formatted using a 5-item Likert scale while allowing free responses after certain sections (see Appendix A). The goal of the survey was to find the challenges that providers face when treating patients on concomitant opioid and benzodiazepine therapies. The survey also sought feedback on potential objectives for a future CE presentation. With the assistance of Amy, the survey was

emailed to Nebraska Physicians registered with the NMA. A summary of the 79 responses received is included in Appendix B.

As I was receiving responses to the needs assessment survey, I began to put together the CE presentation. With Amy's assistance, I had the opportunity to coordinate with the Great Plains Quality Innovation Network (GPQIN) to create the final objectives of the CE webinar and provide information required for an email advertisement. The CE presentation was accredited by the NMA while final walkthrough and presentation dates were scheduled. To broaden the audience of the survey, we decided to invite all types of clinicians (e.g., nursing, pharmacists, providers) from any location (i.e., we would no longer limit the CE presentation to Nebraska physicians). I completed an extensive literature search to piece together the final CE presentation. The CE presentation would include recommended non-opioid and non-benzodiazepine therapies for treating patients with pain and mental health conditions. The presentation also provided guidance on tapering opioids and benzodiazepines while providing tools on discussing these topics with patients. A final walkthrough of the presentation was completed virtually on March 22nd. On March 27th, I traveled to the GPQIN office in Lincoln to deliver the live CE webinar. The slides used for the presentation can be found in Appendix C, and the results of pre- and post-assessment questions can be found in Appendix D. Additional information on this presentation and its impact on clinician knowledge and comfort in treatment patients can be found in the final Capstone paper.

I believe my background in pharmacy significantly helped me throughout this Service Learning and Capstone experience. In creating the focus for the project, I drew from my personal experiences and anecdotes of patients receiving unsafe combinations of opioids and

other depressants. My clinical background and previous experience in research allowed me to navigate through a large amount of literature to create an appropriate needs assessment survey and effective CE presentation. I also faced several challenges throughout this learning experience. Prior to creating the project proposal, I found it difficult to narrow the project focus while making sure it aligned with the requirements of the Service learning and Capstone course. Discussing the project with Amy and Dr. Wehbi helped me finalize the project to ensure it would be mutually beneficial to me and the NeDHHS while also being achievable. Additionally, while a few physicians were welcoming and motivated to meet and discuss the project, I found that the idea of traveling to meet providers to obtain in-person responses for the needs assessment within the timeline of my project would be extremely difficult. After discussing with Dr. Tape, it was recommended that I utilize email to obtain electronic responses for the needs assessment survey to minimize respondent time commitments. During the summer of 2018, several life changes occurred that made continuing the project at an effective pace difficult. I began a new position with my employer that included increased responsibilities and time commitments. During this same time, I also bought a house. These time commitments put a substantial strain on the project. After Amy transitioned to her new position at the NMA, it took some time for me to reach out to Ashely and dedicate the time necessary to complete the Capstone project. However, these experiences helped me improve my communication and time management skills. I truly believe these skills developed as a result of these challenges will help me long after the completion of my education.

During this experience, I have realized that great things are possible when individuals from separate areas of expertise collaborate towards a common goal. During my pharmacy

education, the curriculum stressed the importance of learning to work on an interprofessional team. This ideology came together again in a different context during this service learning and capstone experience. Creating connections to several individuals and organizations proved to be invaluable throughout this process. By interacting with experts from medicine, health systems, and health plans, I was able to form a well-rounded vision of the current opioid epidemic and the interventions being deployed to decrease the incidence of opioid overdose. I have also learned there are many individuals who are willing to dedicate a considerable amount of time to assisting with a project if it aligns with their personal or professional goals. I had a great experience interacting with several individuals and organizations that ultimately lead to the success of the needs assessment and CE webinar. Finally, I have developed project management skills along the way that should help me going forward.

My public health education was crucial to the success of the Service Learning and Capstone experience. During the public health curriculum, I developed skills in survey development while learning the importance of performing a needs assessment that motivated my project proposal. The skills developed in Biostatistics and Applied Research in Public Health allowed me to choose an appropriate statistical test and interpret my results. I utilized ideologies from Health Behavior and theoretical models to prepare an effective CE webinar aimed at overcoming the stigma of opioid use and therapies such as medication-assisted treatments (MAT) to encourage the use of evidence-based practices. I strongly believe that the public health curriculum provided a foundation of skills and practices that facilitated my success in completing this Service Learning and Capstone project.

Acknowledgements

Nebraska Department of Health and Human Services, Division of Public Health

Ashley Newmyer, Deputy Director, Capstone Committee Preceptor

University of Nebraska Medical Center, College of Public Health

Dr. Nizar Wehbi, Assistant Professor, Acting Deputy Director, Capstone Committee Chair

Dr. Brandon Grimm, Associate Professor, Interim Director, Capstone Committee Member

Nebraska Medical Association

Dale Mahlman, previous Executive Vice President

Amy Reynoldson, current Executive Vice President, previous Capstone Committee Preceptor

Meghan Johnson, Membership and CME Director

Great Plains Quality Innovation Network

Paula Sitzman, Quality Improvement Advisor

Tammy Baumann, Quality Improvement Advisor

Other stakeholders with contributions to Service Learning activities

Dr. John Massey, Task Force Chair of the NeDHHS Pain Guidance Document

Dr. Thomas Tape, Chief of the UNMC Division of General Internal Medicine

Dr. Ann Polich, Vice President of Quality and Performance Improvement at Methodist Health System

Appendices

Appendix A. Survey to Assess Barriers and Challenges to Treating Patients Prescribed both an Opioid and Benzodiazepine (adapted from the Google Forms version)

Section 1: Please answer the following demographic questions:

1. What type of provider are you (e.g., Physician, Physician Assistant, Nurse Practitioner, etc.)?

2. Please specify the area of medicine you would consider your specialty (e.g., Internal Medicine, Family Medicine, Psychiatry, Pain Management, etc.)?

3. Which of the following best describes the area you practice most of your time in?
 - a. Urban (e.g., city with greater than 50,000 people)
 - b. Rural (e.g., city with less than 50,000 people)

Section 2: Please select the option that best describes how often you use the following strategies when treating patients prescribed opioid analgesics and benzodiazepines:

4. When tapering a patient off an **opioid**, I use the following strategy or strategies:

	Never	Rarely	Sometimes	Usually	Always
Prescribe therapies such as hydroxyzine and clonidine for withdrawal side effects					
Provide or refer to psychosocial support such as cognitive behavioral therapy					
Refer patient to pain specialty care or a provider specializing in pain management					
Refer patient to medication assisted treatment (MAT)					

5. When tapering a patient off a **benzodiazepine**, I use the following strategy or strategies:

	Never	Rarely	Sometimes	Usually	Always
Switch from a short-acting drug (such as alprazolam) to a long-acting drug (such as clonazepam)					
Prescribe therapies such as hydroxyzine and trazodone for withdrawal side effects					
Use rapid taper of benzodiazepine using adjuvant anti-epileptic medications such as valproate or carbamazepine					
Provide or refer to psychosocial support such as cognitive behavioral therapy					

6. I use assessment tools such as the PHQ-9 (Patient Health Questionnaire for Anxiety and Depression), GAD-7 (General Anxiety Disorder scale), or PC-PTSD (Primary Care Screen for Post-Traumatic Stress Disorder) to screen patients for co-occurring mental health conditions.

- a)Never b. Rarely c. Sometimes d. Usually e. Always

7. I use assessment tools such as the ORT (Opioid Risk Tool) or SOAPP-R (Screening and Opioid Assessment for Patients with Pain-Revised Screening Test) to establish a patient’s susceptibility to substance abuse.

- a)Never b. Rarely c. Sometimes d. Usually e. Always

Section 3: Please select the option that best describes your level of agreement with the statement.

8. The following are barriers to tapering patients off **opioid** therapies:

	Strongly Disagree	Disagree	Neither Disagree or Agree	Agree	Strongly Agree
There is a limited availability of effective alternative therapies for pain					
There is a lack of information on how to taper opioid therapies					
Tapering opioid therapies threaten the provider-patient relationship					
There is insufficient time to taper patients off opioid therapies					

9. The following are barriers to tapering patients off **benzodiazepine** therapies:

	Strongly Disagree	Disagree	Neither Disagree or Agree	Agree	Strongly Agree
There is a limited availability of effective alternative therapies for anxiety disorders					
There is a lack of information on how to taper benzodiazepine therapies					
Tapering benzodiazepines threaten the provider-patient relationship					
There is insufficient time to taper patients off benzodiazepine therapies					

10. The following contribute to patients remaining on **concomitant opioids and benzodiazepines**

	Strongly Disagree	Disagree	Neither Disagree or Agree	Agree	Strongly Agree
Patients appear stable on these medications with no adverse effects					
It is difficult to coordinate with other prescribers to taper therapies					
The benefits of concomitant opioids and benzodiazepines appear to exceed the risks					
Discontinuing these medications can cause patients to seek non-prescribed or illicit drugs					

11. Please list any additional reasons that contribute to patients remaining on concomitant opioids and benzodiazepines:

12. I feel equipped to treat patients with chronic pain and co-occurring substance abuse disorder.

- a. Strongly Disagree b. Disagree c. Neither Disagree or Agree d. Agree e. Strongly Agree

13. I feel equipped to treat patients with chronic pain and co-occurring mental health conditions.

- a. Strongly Disagree b. Disagree c. Neither Disagree or Agree d. Agree e. Strongly Agree

14. There are barriers to referring patients to:

	Strongly Disagree	Disagree	Neither Disagree or Agree	Agree	Strongly Agree
Medication assisted treatment (MAT) programs or providers specializing in addiction medicine					
Pain specialty care or providers specializing in pain management					
Mental health services, such as individual counseling and group therapy					

If you answered 'Agree' or 'Strongly Agree' to any of the statements in the previous question, please describe the barriers:

Section 4: Please select your level of interest in listening to a presentation with Continuing Education (CE) credit containing the following objectives:

- A. Discuss the increased risk of morbidity and mortality in patients co-prescribed opioid analgesics and benzodiazepines
 - I. Not Interested to Very Interested (5-point Likert scale)

 - B. Describe national and state trends in drug overdose deaths involving the combination of opioid analgesics and benzodiazepines
 - I. Not Interested to Very Interested (5-point Likert scale)

 - C. Evaluate the evidence to support therapies for the treatment of anxiety, insomnia, and pain
 - I. Not Interested to Very Interested (5-point Likert scale)

 - D. Evaluate the evidence to support strategies to taper opioid analgesics and benzodiazepines
 - I. Not Interested to Very Interested (5-point Likert scale)

 - E. Discuss appropriate patient selection for referral to pain management, mental health services, medication-assisted treatment, or other specialty care
 - a) Not Interested to Very Interested (5-point Likert scale)
15. What other information would you like included in a CE presentation about concomitant opioid and benzodiazepine use?

Appendix B. High level results of Survey to Assess Barriers and Challenges to Treating Patients

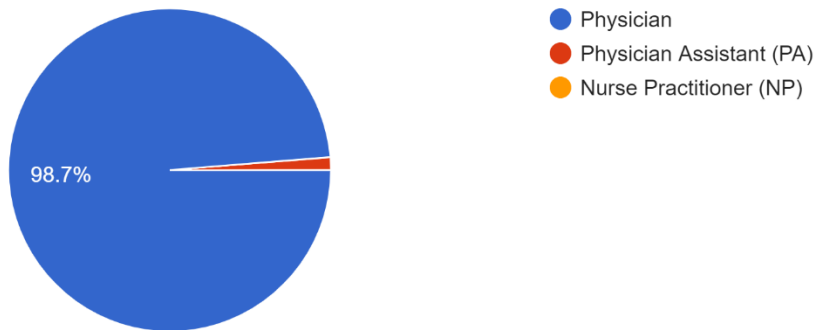
Prescribed both an Opioid and Benzodiazepine (Google Forms)

Note: Full results in attached Excel document

Section 1: Please answer the following demographic questions

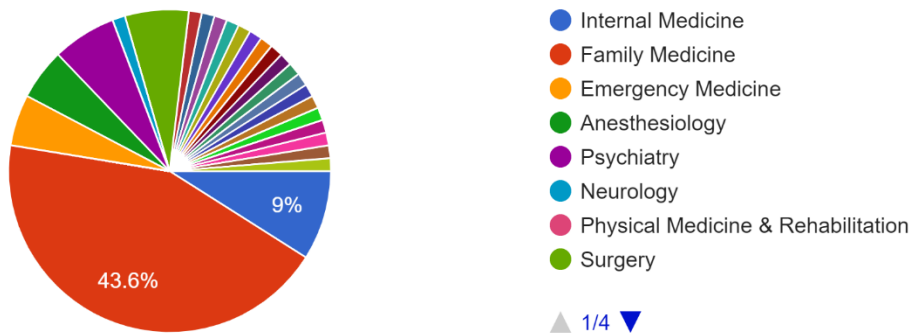
What type of provider are you?

78 responses



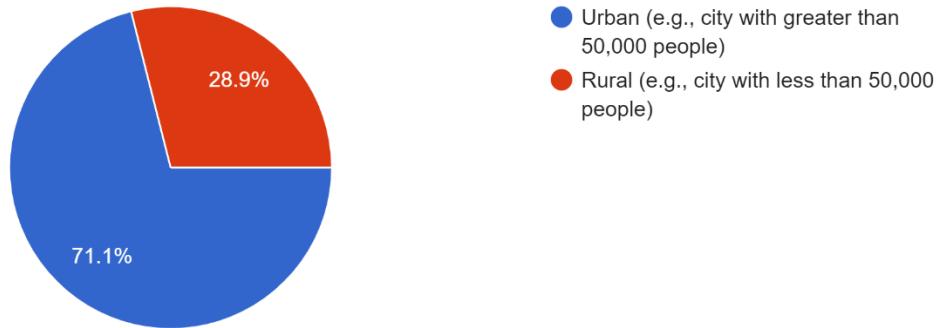
Please specify the area of medicine you would consider your specialty

78 responses



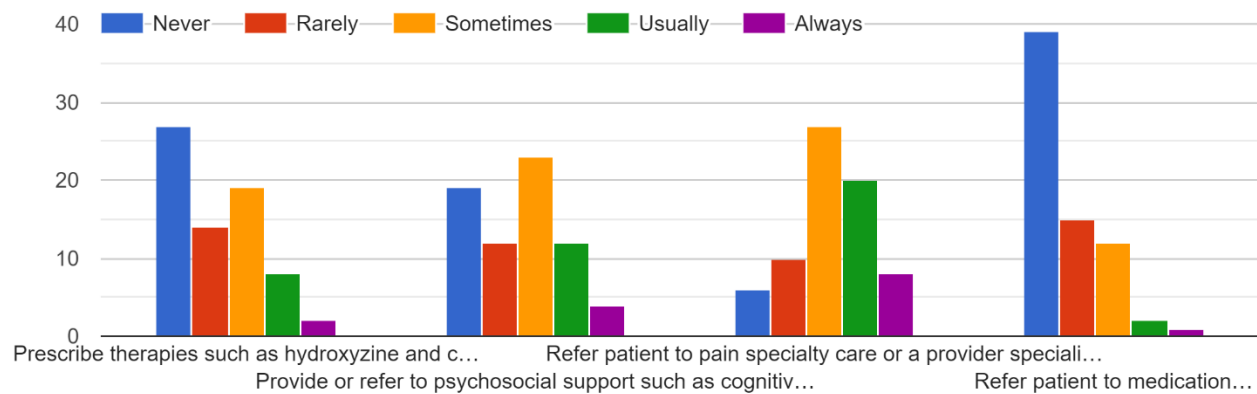
Which of the following best describes the area you practice most of your time in?

76 responses

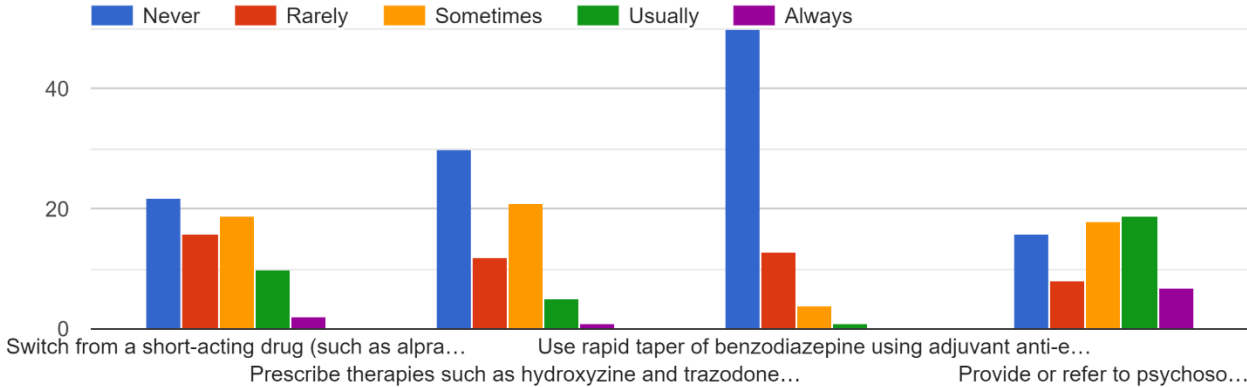


Section 2: Please select the option that best describes how often you use the following strategies when treating patients prescribed opioid analgesics and benzodiazepines

When tapering a patient off an opioid, I use the following strategy or strategies:

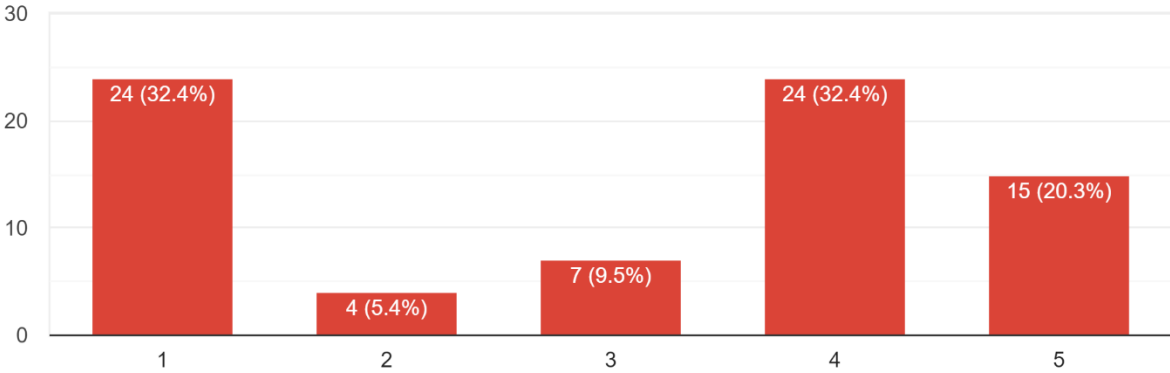


When tapering a patient off a benzodiazepine, I use the following strategy or strategies:



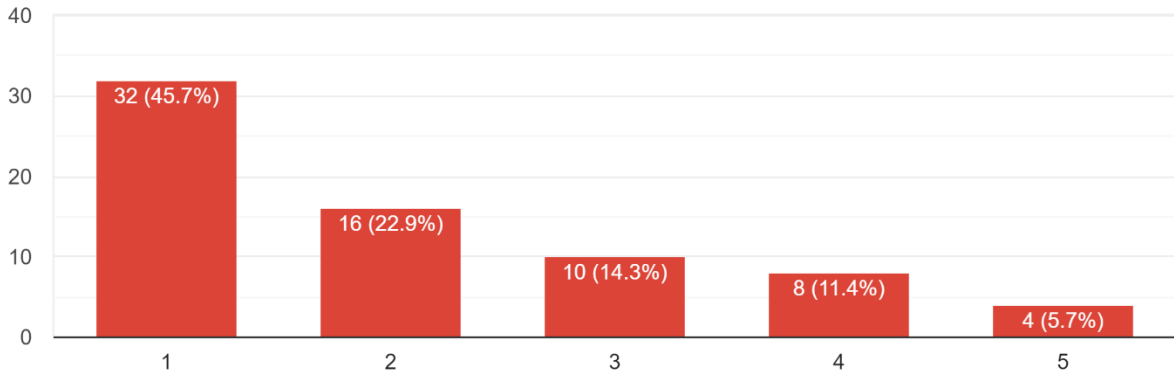
I use assessment tools such as the PHQ-9 (Patient Health Questionnaire for Anxiety and Depression), GAD-7 (Generalized Anxiety Disorder-7) to assess co-occurring mental health conditions.

74 responses



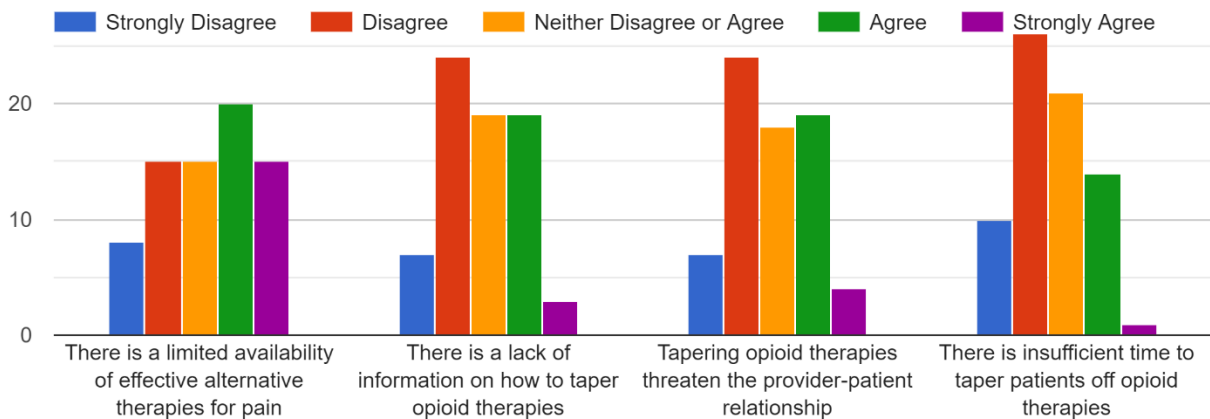
I use assessment tools such as the ORT (Opioid Risk Tool) or SOAPP-R (Screening and Opioid Assessment for P...’s susceptibility to substance abuse.

70 responses

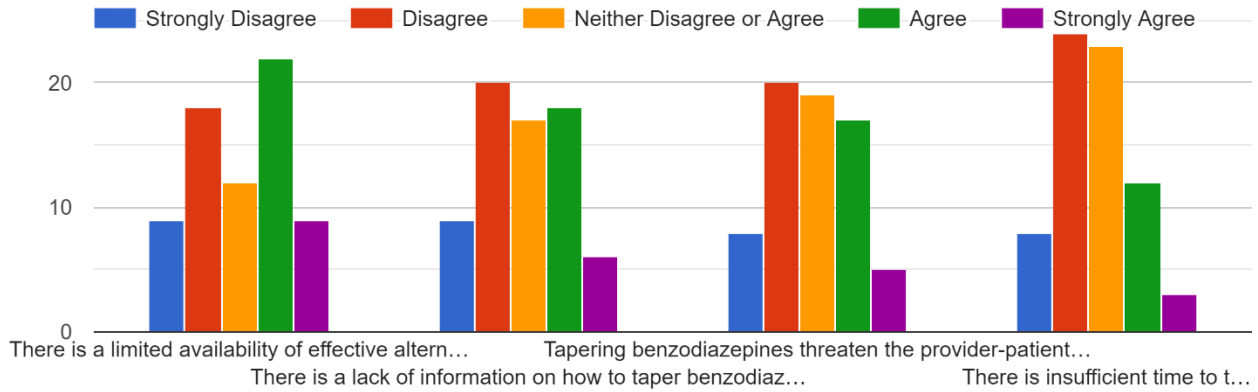


Section 3: Please select the option that best describes your level of agreement with the statement

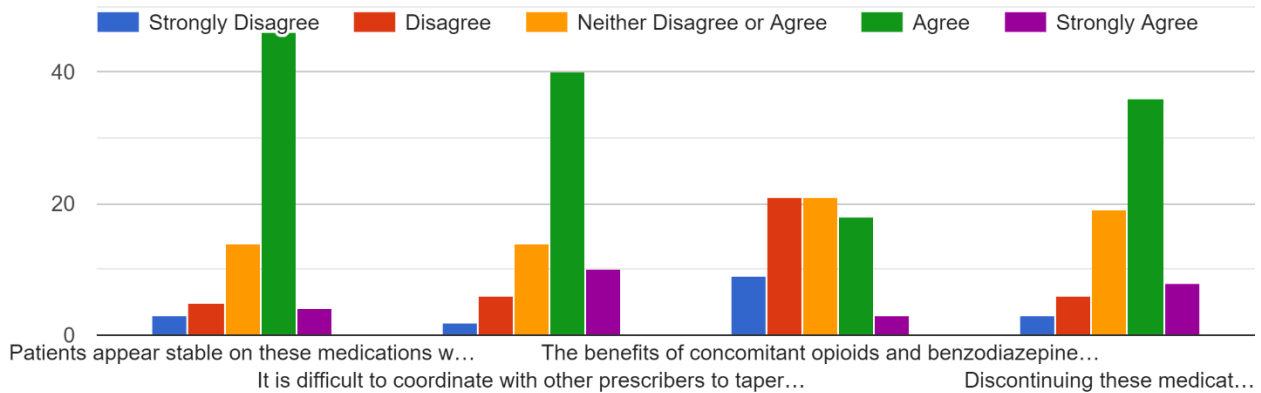
The following are barriers to tapering patients off opioid therapies:



The following are barriers to tapering patients off benzodiazepine therapies:

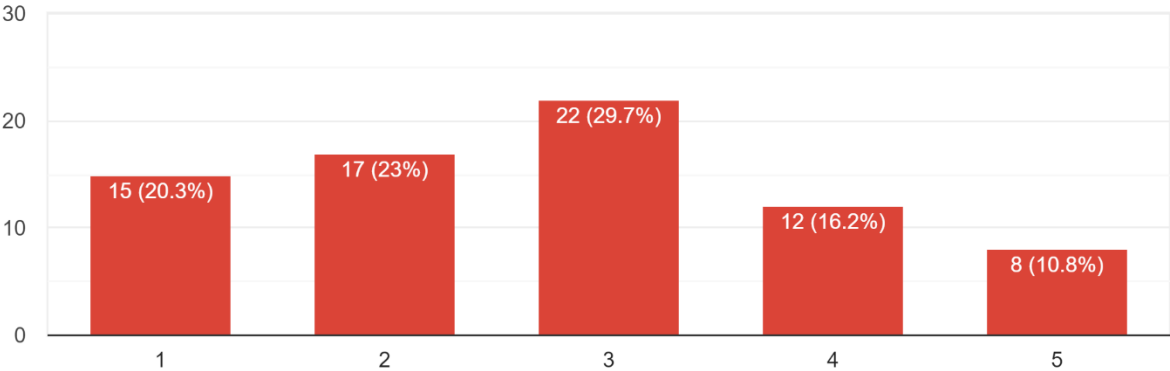


The following contribute to patients remaining on concomitant opioids and benzodiazepines:



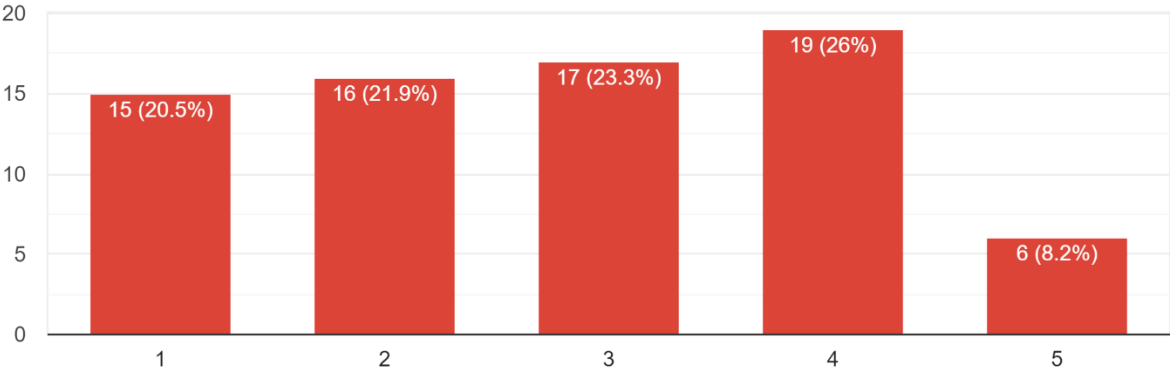
I feel equipped to treat patients with chronic pain and co-occurring substance abuse disorder.

74 responses

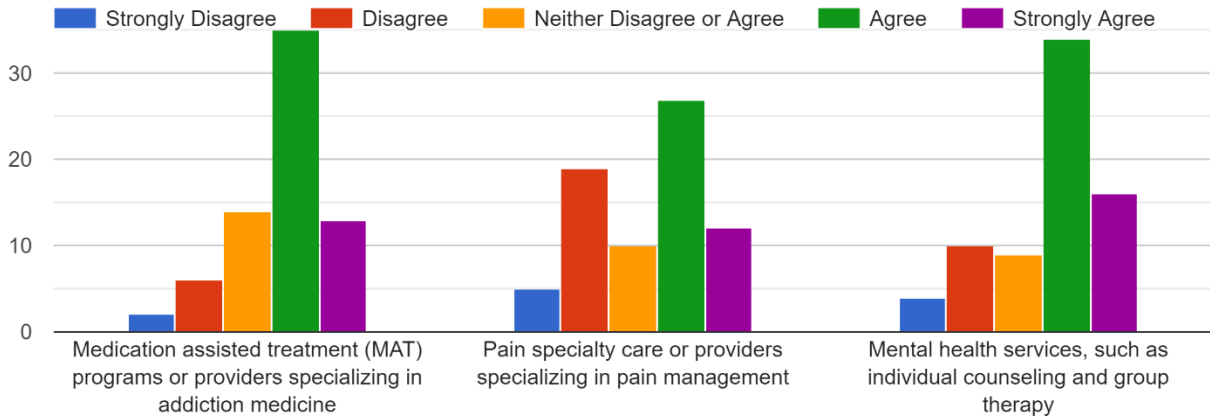


I feel equipped to treat patients with chronic pain and co-occurring mental health conditions.

73 responses



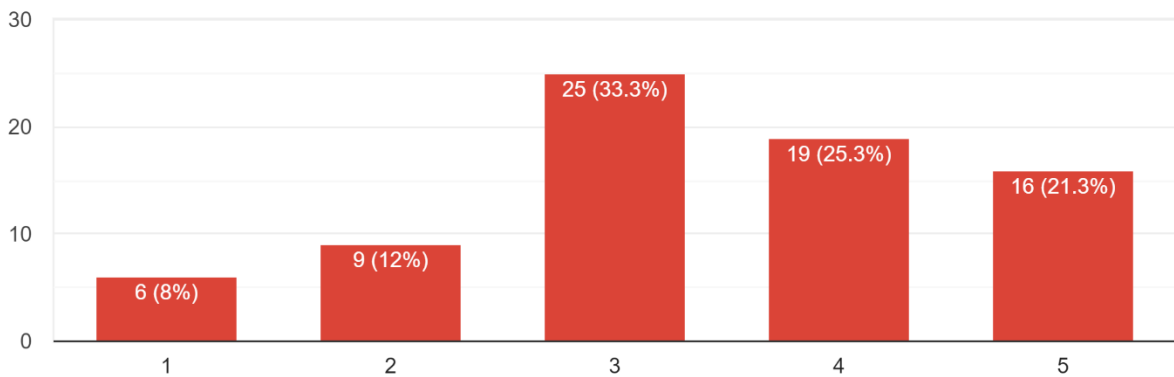
There are barriers to referring patients to:



Section 4: Please select your level of interest in listening to a presentation with Continuing Education (CE) credit containing the following objectives:

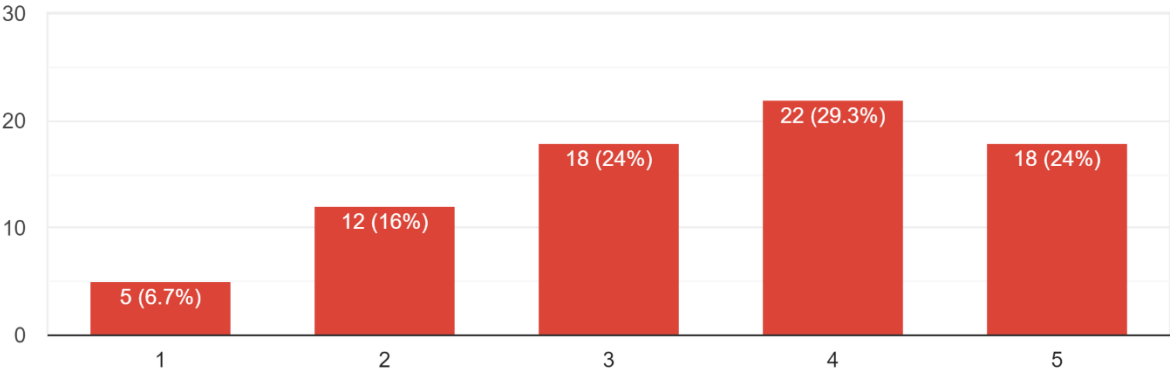
Discuss the increased risk of morbidity and mortality in patients co-prescribed opioid analgesics and benzodiazepines

75 responses



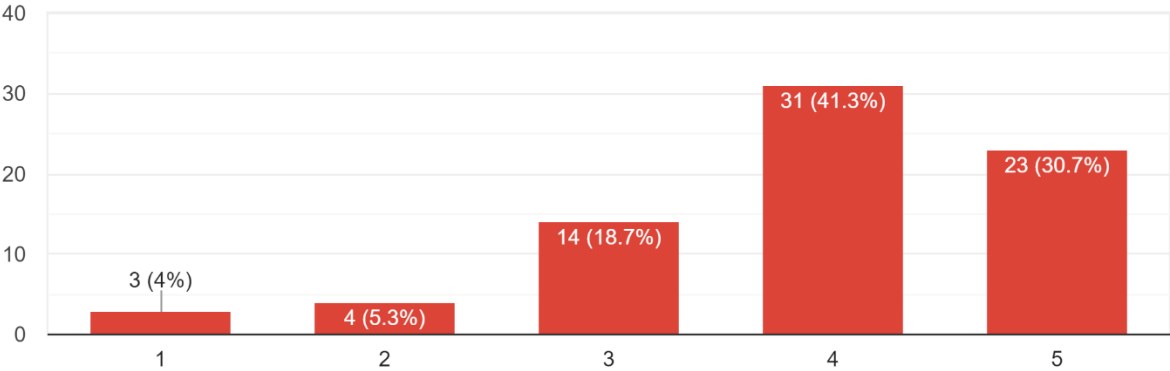
Describe national and state trends in drug overdose deaths involving the combination of opioid analgesics and benzodiazepines

75 responses



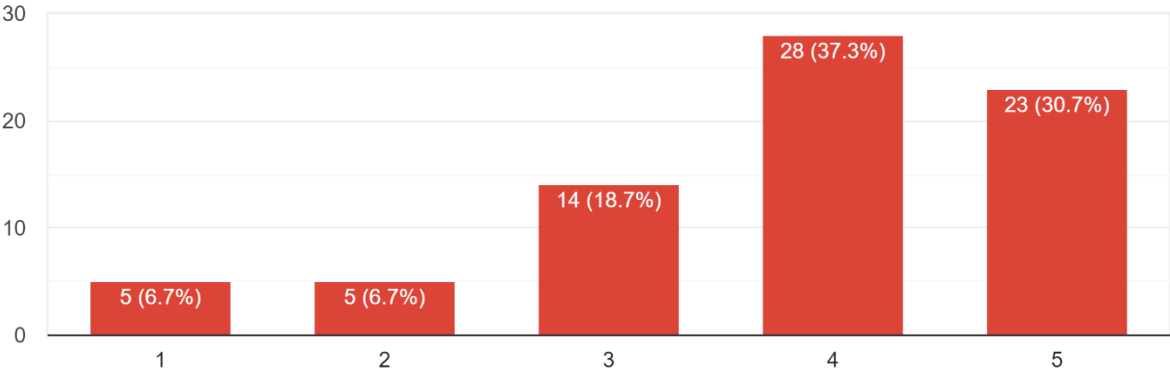
Evaluate the evidence to support therapies for the treatment of anxiety, insomnia, and pain

75 responses



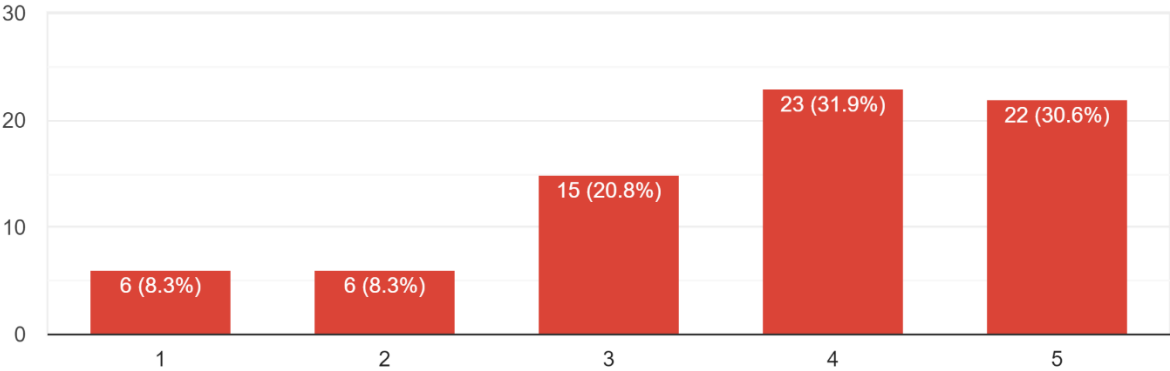
Evaluate the evidence to support strategies to taper opioid analgesics and benzodiazepines

75 responses



Discuss appropriate patient selection for referral to pain management, mental health services, medication-assisted treatment, or other specialty care

72 responses



Appendix C. See attached PDF document of PowerPoint Slides. Overcoming the Challenges to Treating Patients on Concomitant Opioid and Benzodiazepine Therapy

Appendix D. Results of Pre- and Post-Webinar Responses in Study Sample

			I am knowledgeable of effective non-opioid therapies to treat chronic pain		I am knowledgeable of effective non-benzodiazepine therapies to treat anxiety disorders		I feel comfortable tapering my patients off opioid therapies		I feel comfortable tapering my patients off benzodiazepine therapies		[Going forward,] I [will] utilize assessment tools and Prescription Drug Monitoring Program (PDMP) data to evaluate the risk of medication misuse when prescribing opioids or benzodiazepines for long term use.	
Clinician Type	State	Urban/Rural	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
nursing	NE	Urban	3	5	3	5	3	5	3	5	2	5
nurse practitioner	NE	Rural	4	5	4	5	3	5	3	5	5	5
nurse practitioner	NE	Rural	4	4	4	4	3	5	3	4	3	5
nursing	KS	Urban	4	4	4	3	4	4	4	4	4	4
pharmacist	NE	Urban	4	5	4	5	4	5	4	5	5	5
nursing	SD	Rural	4	4	4	4	4	4	4	3	3	4
physician assistant	NE	Rural	4	5	3	5	4	5	4	5	2	5
nursing	NE	Rural	4	4	4	4	2	4	2	4	2	4
nursing	OK	Urban	4	4	3	4	3	4	3	4	5	4
nursing	NJ	Urban	4	5	4	5	3	5	3	5	3	5
physician assistant	NE	Rural	5	4	2	4	5	4	5	4	3	4
physician	NE	Rural	4	4	2	4	3	3	4	3	4	3
pharmacist	RI	Urban	4	4	4	4	3	4	3	4	3	4
nursing	NE	Urban	4	5	4	5	4	5	4	5	4	5
nursing	NE	Rural	4	5	4	5	3	4	3	4	5	4
other	NE	Urban	3	4	3	4	3	3	3	3	3	4
nursing	KS	Rural	3	4	2	4	3	4	3	4	3	5

			I am knowledgeable of effective non-opioid therapies to treat chronic pain		I am knowledgeable of effective non-benzodiazepine therapies to treat anxiety disorders		I feel comfortable tapering my patients off opioid therapies		I feel comfortable tapering my patients off benzodiazepine therapies		[Going forward,] I [will] utilize assessment tools and Prescription Drug Monitoring Program (PDMP) data to evaluate the risk of medication misuse when prescribing opioids or benzodiazepines for long term use.	
Clinician Type	State	Urban/Rural	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
nursing	IL	Urban	3	4	2	4	1	4	1	4	3	5
physician	NE	Urban	4	4	3	4	4	3	3	3	4	4
nurse practitioner	NE	Rural	4	4	4	4	4	5	4	5	2	5
pharmacist	NE	Rural	4	4	4	4	3	3	3	3	4	5
nursing	NE	Rural	4	3	4	3	4	2	4	2	3	3
physician assistant	NE	Rural	5	4	5	4	5	3	5	3	5	4
pharmacist	NE	Rural	4	4	4	4	3	4	3	4	4	4
physician	NE	Rural	3	4	3	4	3	4	3	4	3	5
other	RI	Urban	5	4	5	4	5	3	5	4	5	5
physician	NE	Rural	4	4	3	4	3	4	3	4	3	4
pharmacist	NE	Rural	4	5	4	5	3	5	3	5	3	5
physician assistant	NE	Rural	4	5	2	5	4	5	4	5	4	5
nursing	NE	Rural	4	4	4	4	3	4	2	4	3	4
physician	NE	Rural	5	5	5	5	5	5	5	5	5	3

*1 = Strongly Disagree; 2 = Disagree; 3 = Neither Agree or Disagree; 4 = Agree; 5 = Strongly Agree