



Johnson Foundation Future of Nursing Scholars, which also funded me during my PhD program and throughout my post-doc. So, a little bit of background about what I'm going to talk about today.

We're really going to focus on chronic pain and the role of nurse practitioners in caring for chronic pain patients in the U.S. So, chronic, non-cancer, musculoskeletal pain will impact about 100 million adult Americans at some point in their lifetime, so that's a third of the U.S. population.

And this is one of the fastest growing reasons why people are seeking healthcare. Chronic pain is the third highest category of all healthcare spending in the U.S. And as we've, kind of, come out of this era of pain is the fifth vital sign, and we don't want to just prescribe an opioid medication for every person who comes in saying they have chronic pain for three months or more, the guidelines for treating patients with chronic pain in primary care have really evolved over the last decade.

So, not only are we thinking about treating patients with opioid medications where clinically indicated inappropriate, but we're also thinking about non-opioid medications, things like NSAIDs that are prescription-



says that 90, what we call, morphine milligram equivalents or more is considered a high-dose opioid and should be used in extremely sparing conditions.

We also wanted to see if there were differences in non-opioid medications, which are increasingly being recommended, again, by the CDC guidelines, the National Academy of Medicine, and other governing agencies, to see, okay, are there differences between these groups and how we're caring for chronic pain as, sort of, a whole. So, that was our first goal.

Our second goal was to see are there differences between these groups of providers in some of the

type of provider that was their assigned primary care provider and who they had a visit with, which is why they got that survey for that patient.

So, at least one visit with their assigned primary care provider. They may have had other visits with other providers during that timeframe, but the person who they're getting these surveys for is really the person who's responsible for managing the majority of their care. And they may have someone step in for them if they're not in for an appointment, but that's really the person that holds decision-making responsibility for the long-term for these patients.

We got patient demographics, we got VA, facility, and state, and we also had patients self-reporting their overall health and their overall mental health as part of the survey. So, these two data sources were merged together, and we took from all these different smaller databases within the corporate data warehouse, brought these all together, created this merged analysis data set, merged that with the SHEP records, and we ended up with about 275,000 patients who had an assigned primary care provider, some of who did and did not have chronic pain.

We further then whittled that down based on some of our inclusion and exclusion criteria, so patients who had no pain diagnosis were removed. We had four pain diagnoses that we were looking at, osteoarthritis, back pain, neck pain... or, I'm sorry, upper back pain, lower back pain, neck pain, and osteoarthritis. And then we took away patients who had a comorbidity of kidney failure, of liver failure, and of cancer, because these are diagnoses that are going to substantially impact the patient's course of treatment beyond just what type of provider is caring for them.

We removed patients who were in, I believe it was, nine states where NPs did not have authority at the state level to prescribe Schedule II medications, which includes your opioid classes. And this is something that isn't governed by the VA. The VA, kind of, covered in their regulatory changes physician oversight, but the ability to prescribe certain medications is still determined by the state.

So, patients who were in states where NPs or PAs could not prescribe these medications were taken out because there's really nothing to compare it to. And then, if they had missing comorbidity data or it was not clear who their assigned primary care provider was, these patients were also removed. So, we ended up with just under about 40,000 patients who had a chronic pain diagnosis and were cared for in the VA in this time period between 2015 and 2016 by a physician, a nurse practitioner, or a physician assistant.

Within our data, we had the majority of patients being cared for by a physician, and about 8,400 patients being cared for by an NP, and just under 3,000 being cared for by a PA. Again, we looked at different patient characteristics and outcomes in terms of opioid and non-opioid prescriptions.

Demographics we looked at included age, race, ethnicity, assigned sex at birth, and their education level of whether or not this is a person who had secondary education or not. We can talk about that a little bit more, but we were interested to see if there were differences among, let's say, patients who may be more likely to be employed in a manual labor field and may be at higher risk for receiving a chronic pain diagnosis and certain medications.

This is a very simplified way of looking at our sample characteristics. So, within each column, you'll see the patient characteristics that were statistically significantly more likely to be found amongst that provider group. So, physicians were more likely to see patients who were age 65 plus, who had some post-secondary education, who self-reported fair or poor health and fair or poor mental health, who had



ethnicity, are less likely to get an opioid medication, even if they're of the same clinical status and other demographics as White patients or patients of a different race or ethnicity.

And so really to me what this says is that we're asking the wrong question. We're asking, are NPs overprescribing opioids? We should be asking, are NPs equitably prescribing opioids? Because remember, in our sample, we had nurse practitioners as the provider group that was more likely to see White patients along with PAs compared to physicians.

And so this is really a problem that we need to be thinking about as we educate and train the next generation of primary care nurse practitioners is providing chronic pain care in an equitable manner and focusing less, again, on are we overprescribing. So, asking the right questions is really key for us going forward.

And then looking at non-opioid prescriptions, we found pretty similar patterns. So, I thought it was interesting that not only did physicians have higher odds of prescribing an opioid, but physicians also had higher odds of prescribing a non-opioid medication for chronic pain. So, these are your anticonvulsants, your antidepressants, because there are certain antidepressants like Cymbalta that have pain management properties, and there's that, you know, link between mental health and chronic pain.

Prescription NSAIDs, prescription acetaminophen, muscular relaxants, things along those lines, physicians actually had higher odds of prescribing these medications compared to NPs and PAs as well, and there was no significant difference between NPs and PAs. I will add the caveat that with the tens of thousands of patients that we had, these effect sizes, these statistical effect sizes may not really be clinically meaningful in the day-to-day, kind of, practice.

And so this just may be us looking at something with a microscope, but nevertheless, it is interesting. And I'd be curious, and unfortunately, we weren't able to get this data in this study, if NPs or PAs were more likely to refer patients to physical therapy, or to a chiropractor, or an acupuncturist. And I know,

those of nurse practitioners or physician assistants, but these effect sizes might be pretty small in clinical practice.

And so for a policymaker, this is evidence, again, that nurse practitioner care is equal or, in some cases, you're seeing higher satisfaction, or it may even be better than the care that's delivered by other providers. So, key evidence to, kind of, support the case for full practice reform. Patients who were non-Hispanic, White, middle-aged with no post-secondary education were some of the most likely patients to receive an opioid compared to patients who were non-Hispanic Black, and younger, and female wer