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The Perceptions and Attitudes of Medical Students toward Opioid Education: a Qualitative Research Study

By

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Degree to be Awarded: Master of Public Health

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2021

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An abstract of a thesis submitted to the Faculty of the Rollins School of Public Health of Emory University in partial fulfillment of the requirements for the degree of
Master of Public Health
in Behavioral, Social, and Health Education Sciences
2023

ABSTRACT

Background: A major contributing factor of the opioid epidemic has been the inappropriate, over-prescribing of opioids, resulting in increased occurrences of opioid use, overdoses, and deaths. Some studies suggest that the quality and content of medical school education may affect future opioid prescribing behaviors, and there is a lack of standardization in opioid education instructed throughout medical schools. It is crucial to recognize and explore how aspects of opioid education during medical school may influence opioid prescribing behaviors as medical students graduate and become practicing medical providers.

Objective: The goal of this qualitative study was to explore the perceptions and attitudes of medical students regarding the opioid education they have received while in medical school.

Methods: Medical students were recruited using purposive and snowball sampling strategies to participate in focus groups to discuss their insights and experiences surrounding the opioid education they have received at their respective institution. Three focus groups, with four participants each, were conducted on themes surrounding perceptions and attitudes toward opioids, opioid education, and factors surrounding opioid prescribing. Thematic analysis was used to code and analyze the data in MAXQDA.

Results: Participants in the study emphasized the importance of approaching opioid use with both scientific and humanistic perspectives. Participants reported learning about the pharmacology and side effects of opioids during preclinical semesters and observing their use for pain management in patients during their clinical education . However, participants felt that the quality and quantity of opioid education was lacking in both preclinical and clinical education. Despite concerns about future opioid prescribing, participants expected to receive further education during their training in residency. Overall, the education they received allowed them to

understand the various factors affecting opioid prescribing spanning across the socioecological model, from medical providers' implicit biases to the infrastructure surrounding opioid prescribing in the U.S.

Conclusion: Variations in the quality and types of opioid education encountered during medical school were expressed throughout the focus groups. Increasing the quality of opioid education and standardizing it throughout U.S. medical schools may assist in optimizing opioid prescribing behaviors and reducing the risk of adverse patient outcomes from opioid prescribing.

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CHAPTER 1: INTRODUCTION

Introduction and Rationale

Since the late-1990's, the United States opioid epidemic has escalated and evolved, with more than 80,590 overdose deaths in 2022 (Centers for Disease Control and Prevention, 2022). The onset of the opioid epidemic can be traced back to the 1996 introduction of OxyContin by Purdue Pharma, which was advertised as a safe and effective prescription pain relief medication (Lyden & Binswanger, 2019). Assured by claims that the risk of opioid addiction was "less than one percent" (Van Zee, 2009), the rate of opioid prescribing soared into the turn of the millennia, peaking at 255 million prescriptions in 2012 (Centers for Disease Control and Prevention, 2021). The consequences of over-prescribing in the last few decades have contributed to increased occurrences of opioid use, overdoses, and deaths throughout the U.S. Though some prescribing behaviors have improved and prescribing rates have gradually decreased in recent years, rates of heroin and fentanyl use, overdoses, and deaths have risen due to the roughly three-quarters of heroin users who first used prescription opioids (Dart et al., 2015). The consequences of the opioid epidemic have created lasting destruction and suffering, and despite numerous policy interventions and community-led efforts, this public health crisis has no end in sight.

There are a variety of behaviors that affect how medical providers prescribe opioids to their patients. Variation of prescribing behaviors occur for numerous reasons, ranging from factors related to individual medical providers' norms and knowledge, to patient-related factors and hospital and federal policies. Therefore, it is crucial to investigate and examine factors that may have an impact on opioid prescribing behaviors. According to the research literature, the quality and content of medical school education may affect future opioid prescribing behaviors. Studies suggest that medical students who graduate from top-ranked medical schools, according

to U.S. News and World Report, are more appropriate and careful in their opioid prescribing when they become medical providers compared to those who graduate from lower ranked medical schools in the U.S. (Schnell & Currie, 2018). As a result of the lack of standardization in opioid education content instructed during medical school, individual medical schools throughout the U.S. are taking their own approaches to the curriculum for their respective students (Singh & Pushkin, 2019). This is an important consideration to recognize, as it may greatly affect future opioid prescribing behaviors of these individuals as these medical students become medical providers.

As the opioid epidemic continues to flourish, it is important to recognize and target factors that influence inappropriate prescribing behaviors. Furthermore, it is crucial to examine aspects of opioid education during medical training that affect opioid prescribing behaviors.

Problem Statement

There have been over 932,000 opioid overdose deaths from 1999 to 2020 in the U.S., and the numbers continue to climb (Centers for Disease Control and Prevention, 2021). Recent public attention to the topic has clearly demonstrated that there were a variety of elements that led to the dangerous progression of the opioid epidemic, including influences from pharmaceutical companies and federal agencies. While there has been significant progress in reducing the number of opioid prescriptions written annually (Scholl et al., 2019), there continues to be unexplained variation in prescribing behaviors of certain medical providers, and this is considered to be a main driving force of on-going contributions of prescription-originated addiction.

The heterogenous opioid and pain management education in medical school provides one possible explanation for some amount of the variation in opioid prescribing behaviors among

medical providers. By identifying perceptions and attitudes of medical students towards pain management and the use of opioids, it may be possible to expose and resolve the underlying cause of the variation at an early stage. Beyond long-term implications, this is important to investigate now, as it may help standardize pain management and opioid education across medical schools in the U.S. The purpose of this qualitative study is to explore the perceptions and attitudes of medical students regarding the opioid education they have received.

Theoretical Framework

Theories of health behavior help to explain underlying influences that affect human behavior and, as a result, proceeding actions related to health outcomes. Agency Theory (AT) is useful in explaining how cooperative systems function to unfold how information is transmitted (Eisenhardt, 1989). The agent party relies on the principal party for knowledge and to solve problems. This theory helps describe how principal parties influence agent parties, where agents trust principals to both provide medical knowledge as well as perform medical functions. The Social Cognitive Theory (SCT) provides a framework to comprehend how psychological factors influence health behaviors of individuals (Young, Lipowski, & Cline, 2005). Internal and external factors that impact an individual, such as psychosocial and environmental stimuli, influence their behaviors and resulting outcomes. In the context of the thesis, these constructs help explain how opioid education influences both current and future anticipations and expectations of medical students regarding opioid prescribing as well as how that influence, and other important factors, consequentially shape opioid prescribing behaviors.

Purpose Statement

The purpose of this qualitative research study is to explore the perceptions and attitudes medical students have regarding the opioid education they have received. Qualitative research

allows investigators to examine the thoughts and experiences of the participants to capture how participants describe the phenomena based on their own lived experiences. Their responses may help better describe the phenomena surrounding opioid education. The qualitative study design utilizes focus group discussions to extract information-rich responses from participants. An inductive approach to the data analysis assisted in the development of a conceptual model to better understand the behavioral science theories that may be at play in the context of this topic. Furthermore, thematic analysis of focus group data is a valuable approach to assist with recognizing common themes among the data retrieved from the focus groups.

Research Question

Therefore, the research question for this study is, "What perceptions and attitudes do medical students have regarding opioid education?"

Significance Statement

The opioid epidemic has proven to be a lasting, challenging public health crisis with no signs of diminishing harms in the near future. Though many factors contributed to the emergence and perpetuation of the opioid epidemic, variation in opioid prescribing behaviors amongst providers continues to be an under-recognized contributor to the ongoing epidemic. This variation demonstrates that groups of physicians inappropriately prescribe opioids at higher rates than their peers, contributing to patient harm and decelerating efforts to combat the opioid epidemic. The literature surrounding this topic has highlighted that the lack of standardization of opioid and pain management education in medical schools, as well as differences in the quality of this education, influence future opioid prescribing behaviors of medical students upon graduation. However, there is little research surrounding this area of study and much of it takes a quantitative data analysis approach to investigate, for example, how the ranking of a medical

school affects opioid prescribing behaviors of physicians who had attended a specific medical school. There is a lack of qualitative-methods research that seeks to examine how medical students' perceptions and attitudes toward the opioid education they have received may impact their future opioid prescribing behaviors.

It is important to understand the anticipated barriers, hesitations, and gaps in knowledge that exist of medical students so that improvements toward the quality of opioid education may be implemented to produce future safer prescribing practices. There is literature surrounding the concerns physicians have regarding these same concepts as it relates to their current clinical practice. However, there is a lack of literature surrounding the investigation of these concerns of medical students as it pertains to their future clinical practice based on their current educational experiences. Therefore, it is important to understand the nature of this issue not only from the perspectives of those who are current opioid prescribers, but also from those who are future opioid prescribers.

Due to the gaps in the literature, this study will add insights by contributing qualitative data surrounding the perceptions and attitudes of medical students regarding the opioid education they are receiving. As a result, the study will contribute data concerning the influence opioid education may have on medical students' anticipated opioid prescribing behaviors. The data may be utilized to better comprehend the influence the perceived quality of opioid education may have on future opioid prescribing behaviors, which may be tailored to developing improvements and standardization among opioid education across medical schools in the U.S.

Definition of Terms

Term	Definition
Opiate	The natural, chemical substance derived from the opium poppy plant that has been used for pain relief over the last several hundred years
Opioid	The class of narcotic drugs, including natural and synthetic derivatives, that are used for pain relief in medical practice
Opioid Epidemic	The ongoing public health crisis involving the increased use, misuse, and overdose rates of opioids as a result of the increased prevalence of opioids, ranging from prescription pain relief medication to illicit drugs
OxyContin	The brand name of a prescription pain relief medication released by Purdue Pharma in 1996, which is credited for starting the opioid epidemic in the United States; also known as its chemical name Oxycodone
Naloxone	An opioid antagonist that reverses the effects of an opioid overdose; in a nasal-spray version, its brand name Narcan
Heroin	An illicit, semi-synthetic opioid drug
Fentanyl	An illicit, synthetic opioid drug
Opioid Use Disorder (OUD)	The chronic medical condition marked by impairment as a result of opioid use over time, resulting in opioid dependence and addiction
Opioid Overdose	A life-threatening situation characterized by a loss of alertness and consciousness due to taking too many opioids within a short time frame
Opioid Education	In the context of the thesis, any education regarding opioid medications received by medical students during enrollment in medical school; this does not include education of illicit opioid use, such as heroin and fentanyl
Medical Student	A person enrolled in a course of study that will result in their qualification as a doctor of medicine (MD) upon graduation

CHAPTER 2: LITERATURE REVIEW

Introduction

It is vital to understand the history of the opioid epidemic as it relates to this research study and its larger public health context. This understanding allows for a more efficient grasp on how the current problem has manifested from consequences of historic practices and how it creates ongoing impacts. Furthermore, it was important to investigate specific aspects related to the thesis, such as focusing on literature surrounding the impact of opioid education on prescribing behaviors rather than the impact of pharmaceutical sales representatives. The exploration of the state of opioid education across medical schools in the U.S. was also crucial to comprehend when investigating the instruction of medical students and any published qualitative findings surrounding perceptions, attitudes, and experiences of opioid and pain management education. Likewise, anticipated or expected barriers, hesitations, and gaps in opioid knowledge were essential to consider in the literature, as these factors may influence their perceptions and attitudes toward opioid education during medical school and expected encounters when they become prescribers. As a result, the literature review addresses research concerning the barriers, hesitations, and gaps in opioid knowledge experienced by opioid prescribers.

The Emergence of the Opioid Epidemic

Naturally derived from the opium poppy plant, opiates are chemical substances that have been utilized for hundreds of years for pain relief, while opioids are defined as a class of narcotic drugs that include natural and synthetic derivatives (Kerrigan & Goldberger, 2020). For the purposes of the thesis, the latter term is used to reference the focus of the research: pharmaceutical, prescription pain relief medication. The historic avoidance and fear of opiates

from prescribers and patients in the first half of the twentieth century was a significant foundational factor in the development of "opiophobia" in the latter half of the century (Jones et al., 2018). As a result, inadequate treatment of pain, especially cancer and noncancer chronic pain symptoms, became a common practice that followed into the turn of the millennium. For instance, physicians who were likely to exaggerate the hazards of addiction were likely to prescribe lower doses of pain medication to patients (Marks & Sachar, 1973).

However, alarmist sentiments surrounding opioids shifted based on false claims that the risk of opioid addiction was rare, which were the result of a few studies published in the 1980s. One New England Journal of Medicine letter to the editor, in which a single paragraph summarized the research, reported that rates of addiction were low, less than 1%, in patients treated in the hospital with opioids for acute pain (Porter & Jicks, 1980). This became cited as concrete evidence for many years (Van Zee, 2009), and is suggested to be the very early initiator of what grew to be the modern opioid epidemic. Likewise, a similar study found that only two of thirty-eight chronic pain patients had misused or abused opioids during treatment, indicating that a history of drug abuse may have a role to play rather than addiction due to prescription of pain relief medication (Portenoy & Foley, 1986). In the years following these reports, the American Pain Society promoted the "Pain as the Fifth Vital Sign" campaign, advocating for better evaluation and treatment of pain symptoms (Campbell, 1996). Similar to how medical providers manage vital signs such as blood pressure, heart rate, and body temperature, the hope of this campaign was that pain would be evaluated better during patient care visits. Concurrently, the U.S. Joint Commission began endorsing pain management standards, with the hope that physicians would begin prescribing opioids more liberally (Baker, 2017).

While it is important to note that federal and professional organizations stimulated the increase in treatment of pain with prescription opioids, pharmaceutical companies were arguably the key player in contributing to what is now known as the opioid epidemic. Influences of various degrees from these organizations and the pharmaceutical companies occurred throughout overlapping years approaching the onset of the opioid epidemic, resulting in the encouragement of providers to prescribe opioids and having a large supply to do so. The push from pharmaceutical companies to expand opioid prescribing promoted the idea that inadequate treatment of pain was inhumane, directing prescribers to depend more readily on opioids (Tucker & Kathryn, 2004). The opioid epidemic is credited with beginning in 1996, when the Food and Drug Administration approved Oxycontin as a pain relief medication with characteristics "believed to reduce the abuse liability of the drug" (Lyden & Binswanger, 2019). The surge of prescribing was fueled by intense marketing of OxyContin by Purdue Pharma sales representatives, who lavished physicians with gifts ranging from OxyContin-branded office supplies to expensive meals, delivered by sales reps during physicians' lunch breaks (Macy, 2018).

The risks of opioid addiction were dismissed by Purdue sales reps, who distributed videos to doctors promoting phrases like "pseudo addiction," claiming that patients "look like a drug addict because they're pursuing pain relief" and that it's "relief-seeking behavior mistaken as drug addiction" (Purdue Pharma & Lyons Lavey Nickel Swift Inc., 1997). Terms coined by Purdue to assure physicians of the safety of OxyContin were coupled with the misleading report that the risk of addiction was "less than one percent," inspired by the inaccurate claims made in the 1980s (Van Zee, 2009). Furthermore, payments to prescribers from pharmaceutical companies were a strong driving force in the rise of prescribing. Hundreds of thousands of

doctors who prescribed opioids from 2014 to 2015 alone received payment from pharmaceutical companies, and in many cases those who prescribed more often were paid higher sums, as seen in Figure 1 (Kessler, Cohen, Grise, & Bonifield, 2018). Consequently, access to prescription opioids rose dramatically, peaking at 255 million prescriptions written in 2012 alone (Centers for Disease Control and Prevention, 2021).

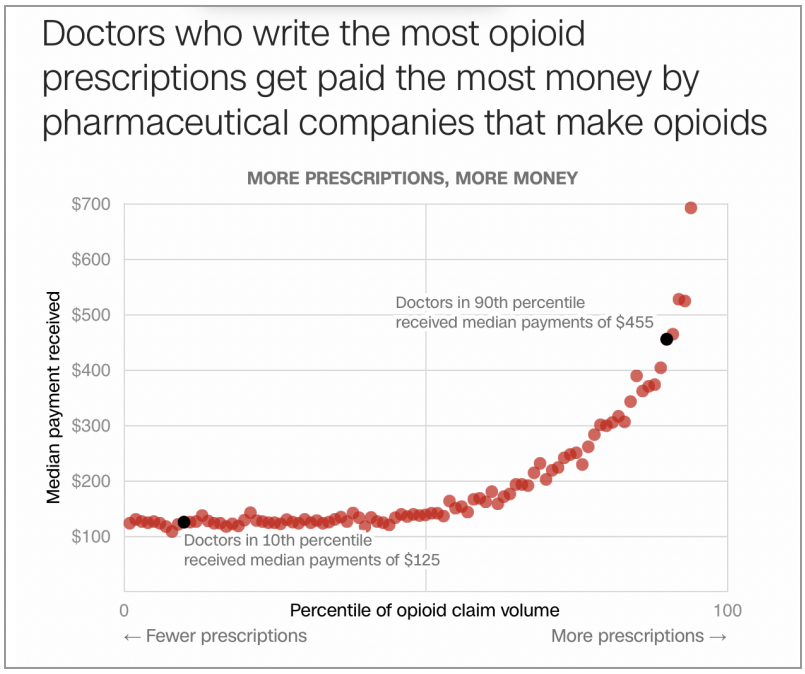

Figure 1. A 2014-2015 comparison of prescription data from Medicare Part D and payment data from the Center for Medicare and Medicaid Services (Kessler, Cohen, Grise, & Bonifield, 2018).

Consequences of the Opioid Epidemic

The summation of these elements created the opioid epidemic, characterized by the concurrent rise in prescription opioids with opioid use and overdose. Though the rise in opioid use has increased, prescription pain relievers have not been the only opioid of concern to public health officials. Trends of heroin use and overdoses have increased concurrently with the rise in prescription opioid use throughout the U.S. during peak prescribing years. The National Survey on Drug Use and Health found that roughly three out of four individuals who use heroin reported

that their heroin use resulted from initial use of prescription opioids (Dart et al., 2015). Similarly, fentanyl use has become a tragic consequence of the opioid epidemic, resulting in increased overdose deaths among individuals of all racial groups, especially African American adults (Lippold, Jones, Olsen, & Giroir, 2019). Though the introduction of an abuse-deterrent OxyContin formula in 2010 was a beneficial decision to decrease misuse of the medication, the outcome was increased heroin use (Alpert, Powell, & Pacula, 2018), since users could not obtain the same high from prescription pain relievers as before the reformulation (Dart et al., 2015).

Although prescription rates have declined in recent years, opioid overdose deaths have comprised the majority of all drug-related overdose deaths in recent years. In 2021, there were 107,000 overdose deaths in the U.S., approximately 80,590 deaths, or 75%, were the result of an opioid according to the Centers for Disease Control and Prevention (CDC) (Centers for Disease Control and Prevention, 2022). Though opioid prescribing rates have steadily declined in the U.S. in recent years, decreases vary among individual states. For instance, according to 2010 to 2016 data from the Prescription Behavioral Surveillance System, daily dosage rates declined more in states like Louisiana and Florida than other states such as Idaho and Maine (Strickler et al., 2020). The variation of prescribing rates among states may differ as a result of differences in monitoring and policy activities at the state-level.

On a national level, though the annual rate of opioid overdose deaths hadn't changed drastically in the late 2010s, many concerns regarding overdose emerged as a result of the COVID-19 pandemic. For example, overdose deaths due to fentanyl increased by 38% from June 2019 to June 2020, which former CDC Director Robert Redfield attributed to how those with substance use disorder (SUD) were immensely impacted by the major disruptions in their day-to-day lives brought by the pandemic (Kuehn, 2021). Though this concern was raised by the

increased presence of fentanyl, use and overdose of prescription opioids were still of grave concern during the pandemic.

Opioid Use Disorder and Opioid Overdose

Opioid use disorder (OUD) is a chronic condition defined by clinical impairment from the use of opioids over time, leading to opioid dependence and addiction (Dydyk, Jain, & Gupta, 2021). Over 2.1 million people currently experience OUD in the U.S., which is a considerable fraction of the 16 million people with OUD globally (Chang et al., 2018). The manner in which people develop OUD varies greatly among individuals, ranging from factors associated with biological, psychosocial, and environmental characteristics (Dydyk, Jain, & Gupta, 2021). OUD is associated with frequent relapses, which are more likely to occur among individuals who are incarcerated compared to those provided long-term treatment (Hser et al., 2015). Withdrawal symptoms of OUD, due to an absence of opioid use, include bodily pain, anxiety, sweating, agitation, and cravings to name several of the side effects (Dydyk, Jain, & Gupta, 2021).

Treatments utilized to combat withdrawal symptoms of OUD include detoxification and opioid maintenance treatment, in which chemical agonists like methadone and buprenorphine, which are opioids themselves, are taken (Lobmaier, Gossop, Waal, & Bramness, 2010). Agonists used to treat OUD are substances that bind to receptors throughout the body's central nervous system to produce a bodily response similar to that of the drug it is acting in place of (Elsevier, 2022). As a result, those experiencing treatment for OUD will encounter agonist treatments as a means of altering the body's opioid dependence and, over time, wean the body off opioids. Antagonists like naloxone, commonly referred to by its brand name Narcan, are fast-acting treatments used to reverse the effects of an opioid overdose once it has begun (Lobmaier, Gossop, Waal, & Bramness, 2010). Antagonists, unlike agonists, bind to receptors throughout the

central nervous system for the purpose of altogether terminating any response the receptors would otherwise naturally produce (Elsevier, 2022). Mortality rates among individuals experiencing OUD, most likely due to an overdose, are six to twenty times greater compared to the general population (Hser et al., 2015), highlighting the grave nature of the opioid epidemic. As a result, antagonists are an important treatment during opioid overdoses because they can stop the effects of the overdose if administered quickly and properly during these fatal situations. The FDA only recently approved the over-the-counter sale of Narcan on March 29, 2023 (Hernandez, 2023), which is a step in the right direction toward widespread access to tools that are essential for treating an opioid overdose and saving lives.

Historic and Current Health Equity Trends

For the last several decades, white Americans have been the racial group that has made up the majority of opioid overdose deaths in the U.S. An analysis conducted by the Kaiser Family Foundation of data from the CDC found that there were 68,630 opioid overdose deaths in the U.S. in 2020, 47,304 of whom were white (Kaiser Family Foundation, 2019). According to statistical analyses involving data from 2008 to 2015, whites and American Indians/Alaska Natives were at a higher risk for opioid overdose fatalities than Hispanics, and the same was true of men compared to women (Altekruse et al., 2020). Regarding data from 2017 to 2018, the mortality rates of opioid overdoses significantly decreased for whites, however, it significantly increased for African Americans and Hispanics (Cano, 2021). Data from the CDC illustrates, in the figure below, the shift of opioid overdose death rates over time across 21 states by race, which demonstrates the switch in burden of overdose from white to African American individuals (Furr-Holden, Milam, Wang, & Sadler, 2021).

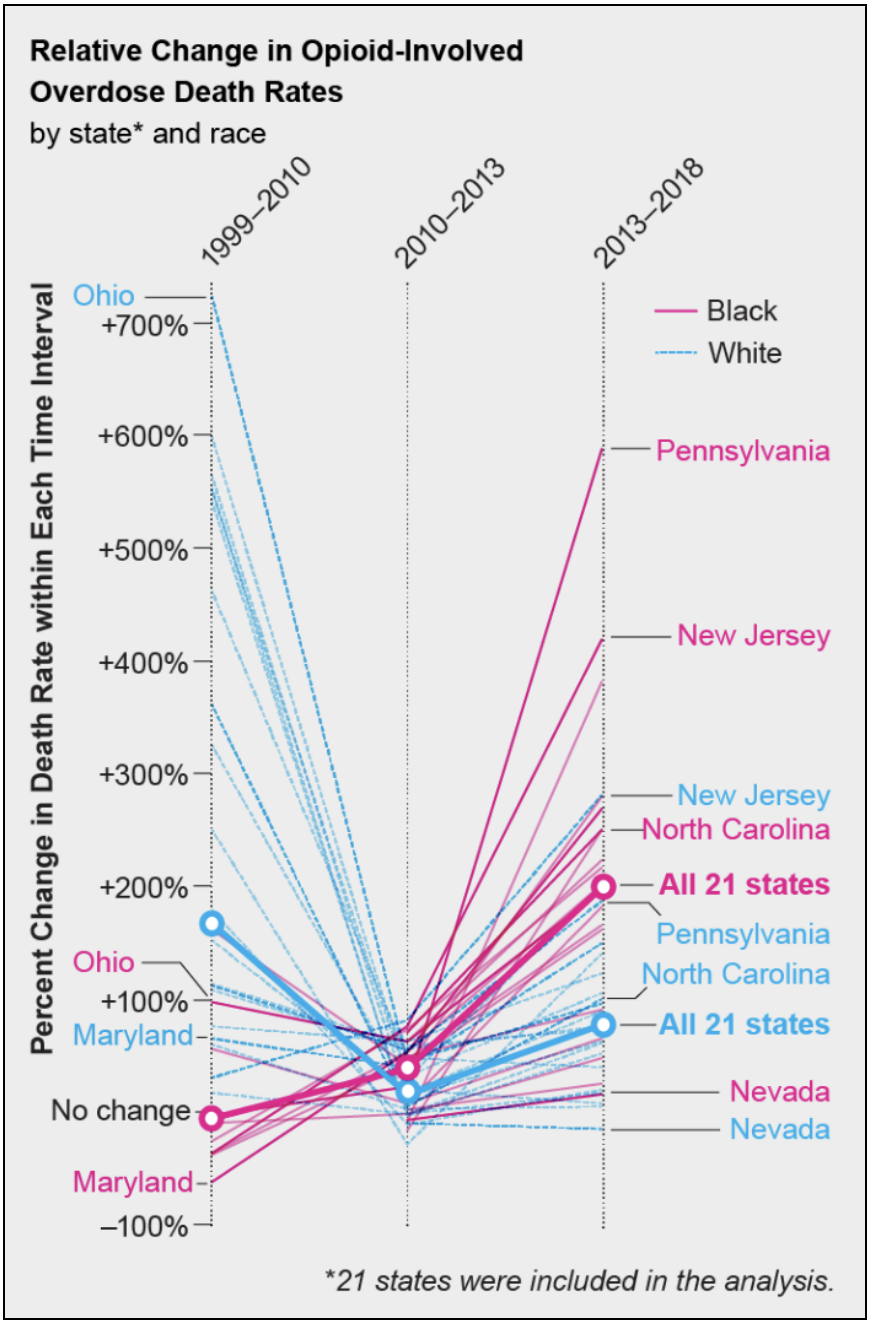

Figure 2. In recent years, the rate of death due to opioid overdose has affected African American individuals (pink) at greater rates than white individuals (blue) across 21 states (Furr-Holden, Milam, Wang, & Sadler, 2021).

Increases in the degree to which an individual experiences socioeconomic marginalization, defined as the systematic lack of opportunities and resources, have been

associated with increases in opioid overdose. These risks among individuals who use opioids are significantly associated with the presence of at least one disadvantageous socioeconomic factor, such as a lack of income, education, health insurance, and social support (Van Draanen et al., 2020). Similarly, socioeconomic status is another indicator that has been shown to be strongly associated with opioid overdose fatality. For instance, individuals who live in economically disadvantaged communities have a higher risk of opioid overdose than individuals who live in economically advantaged communities (Pear et al., 2019). Furthermore, while the opioid epidemic is credited with first emerging in rural communities of Appalachia, data from recent years illustrates that individuals who live in non-rural communities are at a higher risk of death from opioid overdose than those who live in rural communities, especially those in poverty and who lack health insurance (Altekruse et al., 2020).

Health Equity Implications

While most opioid overdose deaths have occurred in white individuals historically, this trend has begun to shift over time. Though the rate of change in opioid overdose deaths in African Americans and Hispanics did not change significantly from 1999 to 2012, according to data from the CDC, the rate significantly increased from 2012 to 2018 (Furr-Holden, Milam, Wang, & Sadler, 2021). Beliefs perpetuated by systematic racism embedded in society concerning false biological differences between African American and whites has resulted, among many other consequences, in racial bias concerning pain perceptions between racial groups. In one study, among white medical students and white medical residents, false beliefs such as “black people’s skin is thicker than white people’s skin” were endorsed by a considerable percentage of respondents, which led respondents to rate the pain of African American individuals lower than white individuals (Hoffman, Trawalter, Axt, & Oliver, 2016).

Racial disparities surrounding pain assessment and treatment exist in clinical settings and, as a result, opioids have been prescribed at different rates among racial groups. Emergency room data from years associated with the beginning of the opioid epidemic illustrate that approximately 40% of white patients presenting pain were prescribed an opioid, while the same was true for only 32% of African American, Hispanic, and Asian patients presenting pain (Pletcher, Kertesz, Kohn, & Gonzales, 2008). Similarly, according to data from the most recent decade of the opioid epidemic, 38.9% of white patients were prescribed an opioid compared to 34.5% of African American patients, who were also prescribed shorter courses of the medication, at the same medical center (Rambachan, Fang, Prasad, & Iverson, 2021). With regards to the prescription of naloxone, the life-saving medication administered during opioid overdoses, there have been discrepancies among racial groups who are prescribed naloxone concurrently with an opioid prescription, with white patients more likely to receive naloxone than patients of color (Madden & Qeadan, 2020).

Similarly, to adults, opioids have been prescribed to treat pain in children at different rates across various races and ethnicities in the U.S. Though children are prescribed opioids at a lower rate compared to adults, it is crucial to recognize that themes of health inequities are present in both age groups. Between 2003 and 2014, white children were more likely to be prescribed opioids by their medical provider compared to children of minority groups, including African American, Hispanic, and Asian children (Groenewald, Rabbitts, Hansen, & Palermo, 2018). Among children who presented with appendicitis in a single emergency department from 2003 to 2010, white children who reported moderate pain were more likely to receive opioids than African American children with the same pain reporting, and the findings were similar when severe pain was reported between those same groups (Goyal et al., 2015). Though few

studies have reported that patient race did not affect the receipt of an opioid prescription (Tamayo‐Sarver et al., 2003), the majority of research published on this topic finds that, in fact, racial and ethnic disparities exist among patients prescribed opioids.

Logically, lower rates of opioid prescribing in recent years would indicate consequent lower overdose death rates, but this is not the case, specifically concerning illicit opioids. While opioid prescriptions have declined, the increased presence of heroin and fentanyl have contributed to opioid overdose deaths in communities of color (Furr-Holden, Milam, Wang, & Sadler, 2021). This may indicate that there are sub-epidemics within the opioid crisis, demonstrating that distinct interventions need to be designed that are tailored to targeted racial and ethnic groups to alleviate these burdens (Lippold & Ali, 2020). This is a grave health equity concern because the management of the opioid epidemic is affecting different racial populations disproportionately. While the rate of overdose deaths are gradually increasing among whites, the rate of overdose deaths among people of color have drastically increased in recent years. Through the acknowledgement and understanding of racial and ethnic inequities surrounding opioids, informative interventions may be developed and implemented to reduce the misfortunes resulting from the opioid epidemic for people of color.

Health disparities that exist among racially and ethnically diverse populations are important to consider when addressing inequities of pain treatment, especially that of chronic pain (Morales & Young, 2021). While the alleviation of pain symptoms for minority individuals may contribute to disparities in pain management by medical providers, it is essential to note that the underreporting of pain may be due to the power imbalance minorities feel during visits with medical professionals (Mossey, 2011). This should warrant caution among medical providers

who seek to comprehend their own biases and stereotypes regarding minority races and cultures, and their recognition of the potential power imbalance at play during patient visits.

Medical Provider Factors that Drive Opioid Prescribing Variation

Medical provider thoughts, behaviors, and training are a primary driver of prescribing, and the consequence of over-prescribing opioids has led to a dramatic fourfold increase in overdose deaths from 1999 to 2009 (Calcaterra, Glanz, & Binswanger, 2013). It is worthwhile to note that various medical specialty groups prescribe opioids at dissimilar rates as a result of specified, localized treatments for pain for different medical needs. National-level data from 2016 to 2017 determined that family medicine and internal medicine physicians were responsible for roughly 37% of the 209.5 million opioid prescriptions over the course of one year (Guy & Zhang, 2018). Similarly, differences in beliefs and values surrounding opioids are present across medical specialties, contributing to variation in prescribing behaviors. For instance, a survey of physicians at a single academic medical center found that internists were more concerned about addiction and prescribing appropriately doses than geriatricians (Lin, Alfandre, & Moore, 2007). Though certain pressures for medical providers to prescribe opioids have always existed, it may be argued that added weight was placed on the shoulders of these providers when the opioid epidemic began to attract the public's attention through mass media. Semi-structured interviews with surgeons revealed that, due to the impacts of the opioid epidemic, there were observed disparities in guideline-concordant opioid prescribing behaviors (Sceats, Ayakta, Merrell, & Kin, 2020).

The concerns medical providers have regarding individual patient factors appear consistent throughout literature, including opioid use, dependence, addiction, and self-management. Providers encounter a variety of internal and external factors when making

decisions regarding drug choice for patients, which can be applied to opioids and other prescription medications as well (Buusman, Andersen, Merrild, & Elverdam, 2007). Internal factors relate to how characteristics of a specific medical provider's identity influence their opioid prescribing decisions, which may include moral norms, habits, past behaviors, and beliefs about capabilities and consequences when prescribing opioids (Godin, Bélanger-Gravel, Eccles, & Grimshaw, 2008). Likewise, important external factors that contribute to physician prescribing behaviors outside of direct provider-patient interactions can include influences from insurance and pharmaceutical companies, federal agencies, health provider associations, medical researchers, and other health care stakeholders (Gallan, 2004). The interplay of such factors relating to both providers and patients, among many other determinants, produce various prescribing behaviors (Sceats, Ayakta, Merrell, & Kin, 2020). For instance, one study conducted semi-structured interviews with family physicians to explore the behavioral determinants associated with opioid prescribing. The researchers found that various individual behavioral determinants interact with one another to explain opioid prescribing behaviors, such as how family physicians' beliefs about consequences of prescribing are interconnected with beliefs about capabilities to prescribing (Desveaux, Saragosa, Kithulegoda, & Ivers, 2019).

The degree to which a medical provider feels confident in their ability to prescribe opioids has been documented throughout the literature, and appears to be a vital factor when explaining prescribing behaviors. For instance, one survey found that younger providers experienced higher levels of stress and greater reluctance in prescribing opioids than older providers, citing that they were less confident in treating chronic pain (Jamison et al., 2014). Similarly, a survey distributed to medical providers who treat chronic noncancer pain at Mayo Clinic Rochester examined associations between clinician attitudes and prescribing practices.

Univariate statistical analysis suggested that clinicians who were highly concerned about opioid addiction, misuse, and dependence were more likely to have confidence in their treatment, but were also less likely to prescribe opioids to patients with chronic noncancer pain (Razouki, Khokhar, Philpot, & Ebbert, 2019). Findings from a different survey conducted at the same Mayo Clinic location found that only 47% of medical providers felt confident in caring for patients with chronic noncancer pain and 82% of medical providers were reluctant to prescribe an opioid, citing concerns including addiction and dependence (Ebbert et al., 2017). Lastly, because prescribers are not traditionally taught about alternative, non-pharmacological pain relief treatment strategies, the common approach has been to prescribe an opioid or nothing, which has not been a successful solution. The understanding of how such factors impact healthcare provider prescribing behaviors is essential when addressing ways to improve decision making processes and patients health outcomes when prescribing opioids to treat pain.

Though it is essential to regard internal and external factors, such as those described above when considering how prescribing behaviors may be influenced, the factor of medical school education is worth exploring further. The ranking of the medical school, the site of initial education and training, has been demonstrated to be a predictive factor of how likely medical providers are to prescribe opioids (Singh & Pushkin, 2019). One report of opioid prescription data from 2006 to 2014 found a profound inverse relationship of these factors, stating that providers who attended the lowest ranked medical schools prescribed approximately three times more opioids than providers who attended top ranked medical schools, shown in Figure 2 (Schnell & Currie, 2018). Medical provider training targeted for those with the highest propensity to prescribe, a large proportion of who studied at the lowest ranked medical schools in

the U.S., could have important public health outcomes to ameliorate the burdens of the opioid epidemic.

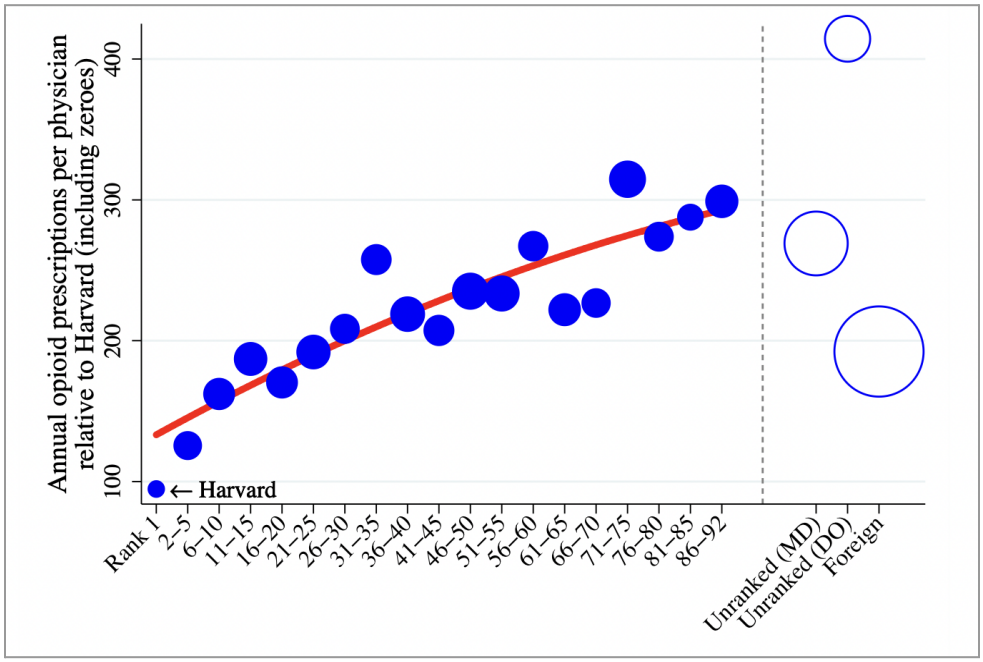

Figure 3. A comparison of opioid prescription frequency by the rank associated with medical schools in the U.S. (Schnell & Currie, 2018).

The findings described above demonstrate an association between medical school quality and opioid prescribing; however, they cannot rule out confounding factors that may explain these findings. For example, it is possible that physicians graduating from top-ranked medical schools are more likely to treat patients with higher socioeconomic status who are healthier on average and experience less pain. If there indeed is a causal relationship between medical school quality and opioid prescribing behaviors, it is important to understand what aspects of medical education are influencing prescribing behaviors. Previous studies do not take specific opioid education instruction into account at the individual medical school level. Therefore, this begs the following consideration: if the quality of the overall medical school influences prescribing behaviors, what is to be said about the influence that the quality of opioid education has on future opioid

prescribing behaviors? Improvements in opioid education should be stressed at the individual medical school level, providing medical providers with the opportunity to perform appropriate opioid prescribing as soon as their medical careers begin.

Medical School Opioid Education during the Opioid Epidemic

Under the administration of former President Barack Obama, a federal initiative was announced to target concerns regarding the opioid epidemic, in which over sixty medical schools signed a pledge to improve their opioid education requirements (Sheet et al., 2016). Medical schools, such as Harvard, refused to sign this pledge because, as former Dean Jeffrey Flier stated, changing curriculum based on what any number of groups say would be "the death of higher education" (Bailey, 2017). By March of 2016, the Association of American Medical Colleges (AAMC) announced that 74 medical schools signed the commitment toward improving instruction of opioids. However, this is under half of the 155 accredited medical schools in the U.S. (Krisberg, 2016).

In response to the opioid epidemic, medical schools took new approaches to refine curriculum as well as enhance pre-existing curriculum for instructing students on how to treat pain with and without opioids. For instance, Duke University Medical School implemented behavioral change counseling information in its students' psychiatry rotation, and Case Western Reserve University School of Medicine added a workshop for its third-year students aimed at addressing pain in patients with SUDs to its already robust addiction curriculum (Howard, 2018). Similarly, the Massachusetts state health department and medical schools located in the state have implemented ten core competencies for all medical students to understand regarding how to evaluate both pain symptoms and addiction risk among other competencies (Karon, 2017). For instance, the University of Boston now requires medical students to complete a new opioids

course and Boston University added the requirement of naloxone training to the basic life support class for first-year students (Bailey, 2017). Though each medical school in Massachusetts was already providing instruction regarding opioids and addiction medicines, the goal of this initiative was to improve this practice and provide medical schools, and their students, the resources needed to "balance the need for pain management with the potential for opioid misuse (Karon, 2017). However, one of the main criticisms from medical students was that these actions were moving at too slow of a pace for medical schools to incorporate, recognizing the present severity of the opioid epidemic.

Though institutional refinement is a significant advancement, medical schools are taking their own approaches to the curriculum, and a lack of standardization has become an unnerving consequence (Singh & Pushkin, 2019). Surveys of such curricula have been conducted at medical schools around the country, and the outcomes have illustrated striking variations in content areas and instruction modalities among institutions (Howley, Whelan, & Rasouli, 2018). As seen in Figure 3, an AAMC survey demonstrated disparities in the number of medical schools that cover opioid prescribing during certain experiences medical students are required to encounter while enrolled (AAMC, 2021). Throughout their education, medical students are faced with many complex clinical experiences which, in many cases, are different from their expectations of there being one correct answer for each patient case. A common, uncomfortable expectation among medical students is being able to recognize medication-seeking behaviors in patients, in which the decision not to advocate for an opioid prescription may result in underserved patient suffering, while the contrasting decision may produce patient harm. The guidance and advising clinical educators provide medical students concerning opioid prescribing behaviors demonstrates immense variability. For example, the outlook of educators that a patient

is a "sufferer" results in a willingness of some providers to prescribe opioids, while the outlook that a patient is a "seeker" inhibits some providers from prescribing opioids (Khidir & Wiener, 2016). As a result, medical students are exposed to a range of decision-making approaches when interacting with clinical educators, which may further result in opioid prescribing differences among peers when students become practicing medical providers upon graduation.

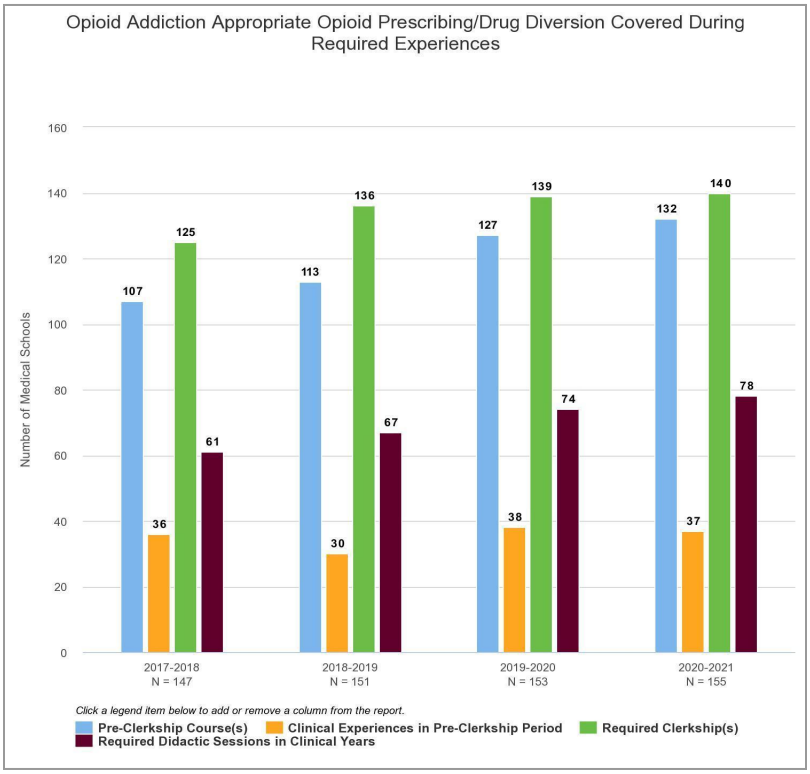

Figure 4. Results from a survey that was distributed to U.S. medical schools including the item "Indicate where in the curriculum opioid addiction (including drug diversion) topics are covered during required experiences." in the four areas of coursework shown above (AAMC, 2021).

Opioid Concerns of Medical Students

Due to the ongoing opioid epidemic, many medical students have expressed hesitancy in prescribing opioids when they become medical providers. For instance, it is common for

first-year medical students to wonder whether patients are truthful or manipulative in their descriptions of pain symptoms during pain-related encounters (Corrigan et al., 2011). Medical students have indicated concerns regarding prescribing opioids during their future practice, whose anticipated concerns are similar to that of current providers' concerns. For instance, in-depth interviews and focus groups including physicians and medical students were utilized to investigate perceived barriers of prescribing naloxone, in which both physicians and medical students expressed similar barriers, including those specific to the drug, provider, and patient (Gatewood, Van Wert, Andrada, & Surkan, 2016). However, medical students have also expressed differences in how they view the opioid epidemic compared to current medical providers. Regarding the survey items "more work needs to occur to minimize stigma related to substance use disorder" and "it is important for individuals with opioid use disorder to have access to naloxone kits," medical students scored higher than physicians and nurses (Shreffler et al., 2021). The support that medical students demonstrated regarding harm reduction was higher than that of physicians and nurses, indicating the growing progressive position of medical students in support of evidence-based practices to combat the opioid epidemic (Shreffler et al., 2021).

Educational interventions have demonstrated promising results for increasing the quality of opioid education medical students receive and, as a result, providing students with necessary preparation to prescribe opioids in their future practice. Interventions utilizing pretest-posttest models have illustrated that graduating students who completed opioid and pain management educational modules reported higher perceived confidence and capability in opioid management, regardless of previous medical school education experiences (Adalbert & Ilyas, 2022). Likewise, graduating medical students at Thomas Jefferson University that completed an online opioid and

pain management educational intervention reported statistically significant increases in levels of confidence, ability, and capability in opioid management compared to baseline measures (Adalbert & Ilyas, 2022). Other similar educational experiences have also assisted in providing medical students with preparation for entering the medical field during the ongoing opioid epidemic. For instance, medical students have indicated that their biases and stigmas surrounding SUD changed as a result of listening to a patient panel, which included individuals with a history of OUD (Dumenco et al., 2019).

The desire for many medical students to learn more about opioid prescribing and treatment is an optimistic sign for the country's future medical providers. Though the former Dean of Harvard Medical School didn't agree with altering the opioid curriculum, the medical students he was responsible for serving did not agree with the Dean. In 2016, Harvard medical students resorted to teaching themselves about treatment methods for opioid addiction and naloxone as a result of dissatisfaction with Harvard's opioid curriculum, where students felt that they were not being properly prepared to become providers during the opioid epidemic (Bailey, 2017).

A Discussion of the Theoretical Framework

Opioid prescribing decision-making processes are complex and multifactorial for medical providers, which may inform the heuristics they employ to perform their prescribing duties (Murshid & Mohaidin, 2017). These decision-making processes may be influenced directly by organizations or institutions associated with a medical provider in some way. Social cognitive theories may act as an essential tool in explaining both intention and predictive behaviors of clinicians (Godin, Bélanger-Gravel, Eccles, & Grimshaw, 2008). Comprehending how internal and external opioid prescribing factors influence medical providers' prescribing decision-making

processes can be aided by analyzing these activities through the framework of social cognitive theories. Such internal and external factors, which may also be referred to as determinants, can be framed by these "theories of change" to explain clinical behaviors, unlike "theories of action" that seek to understand changes to clinical practices (Godin, Bélanger-Gravel, Eccles, & Grimshaw, 2008).

Agency Theory (AT) is defined as a framework to describe the relationship between a principal party and an agent party, in which the principal relies on the agent performing actions and solving problems (Murshid & Mohaidin, 2017). AT provides structure between cooperative systems to further understand how systems of information succeed (Eisenhardt, 1989). Medical providers act as agents toward patients when prescribing opioids, as well as any other type of prescription medication, because their patients trust that their providers are making well-informed, beneficial decisions to achieve healthy outcomes. For instance, it has been argued that pharmaceutical companies can act as agents toward prescribers by providing them with certain information about prescription drugs, which may influence a medical provider's prescribing behaviors to some degree (Epstein & Ketcham, 2014). While the research surrounding this thesis does not focus on pharmaceutical companies as having the main influence on physician prescribing behaviors, opioid education and training provided by medical schools and organizations may act as agents of information. Similarly to how pharmaceutical companies supply physicians with drug information, sources of opioid learning for physicians may also have an effect on how physicians prescribe opioids. For instance, the type of information presented to a medical student about opioids during their education may resonate with them after they graduate and become prescribers themself.

The framework surrounding the Social Cognitive Theory (SCT) helps to understand how psychosocial factors, including personal and environmental stimuli, influence behavior (Young, Lipowski, & Cline, 2005). Self-efficacy is defined as one's own beliefs in their capabilities to perform an action with the purpose of some outcome (Luszczynska & Schwarzer, 2015). The capabilities that one recognizes to be specific to themself may include their knowledge and opinions specific to the actions necessary to reach an end goal. The SCT can be utilized to explain how internal factors specific to an individual medical provider, such as their personal knowledge and beliefs about opioids, may influence their opioid prescribing behaviors. Certain sets of knowledge and beliefs may have been developed as a result of the opioid education they have developed during medical school, so they are important to note when considering how such internal factors affect opioid prescribing. Similarly, many external factors alter the behaviors of medical providers when prescribing opioids, including patient expectations, federal agency standards, and the nature of the clinical setting they are practicing in. The SCT is an important health behavior theory to account for when examining the effect internal and external factors have on opioid prescribing, in which medical school instruction of opioids may contribute to either beneficial or harmful health outcomes for the patient.

There are proposed conceptual models that explain how the above-mentioned theories, as well as similar theories not mentioned, explain provider prescribing decisions and behaviors. However, many of these conceptual models are often complicated, as they attempt to include pharmaceutical, patient, pharmacist, and medical provider factors in a single model (Murshid & Mohaidin, 2017). Though in-depth models help represent key influences, they are often too convoluted and difficult to follow in a linear fashion due to their many arrows. In addition, many

of these conceptual models do not include the influence that opioid education during medical school has on medical providers' prescribing behaviors.

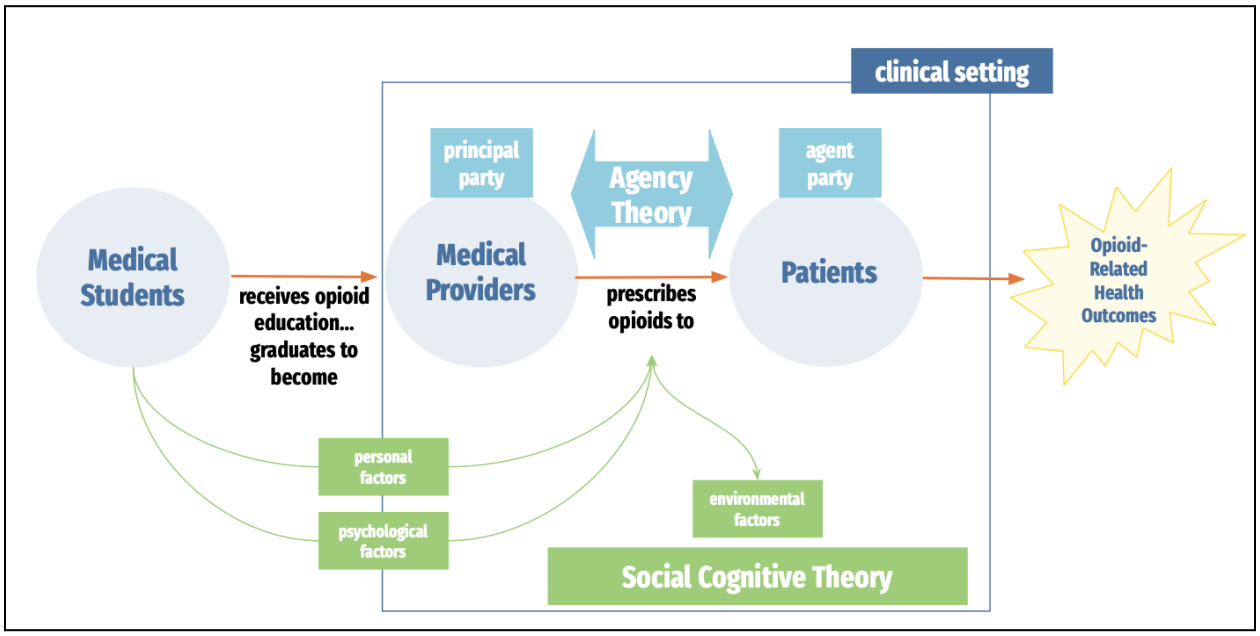

Figure 5. The proposed theoretical conceptual model utilizing the AT and SCT

Summary of the Current Problem and Study Relevance

The opioid epidemic in the U.S. will not vanish anytime soon. Though opioid prescribing has decreased steadily in recent years, there are emerging public health concerns regarding the rising use of illegal opioids, such as heroin and fentanyl, triggered by the opioid epidemic. Likewise, the opioid epidemic has manifested health equity concerns due to increases in opioid use in racial and ethnic minority groups when rates of opioid use are decreasing in whites. While efforts have been taken in the last decade to mitigate the rate of inappropriate opioid prescribing, these frequencies vary by medical provider across the country. Many factors may influence opioid prescribing behaviors of medical providers, and data have demonstrated that the quality of medical school education influences consequent opioid prescribing behaviors. Likewise, the lack of standardization of opioid education among medical schools likely contributes to the variation

of opioid prescribing behaviors when medical students become practicing medical providers. As the opioid epidemic has progressed over the last few decades, hundreds of thousands of medical students graduated into the opioid epidemic. Furthermore, enrollment in medical schools across the U.S. has grown by 37.5% over the last twenty years (Boyle, 2021). Therefore, as more students pursue a career in medicine, it is crucial that the standard for opioid education increases and becomes standardized throughout the U.S. in hopes of significantly combating the opioid epidemic for decades to come.

The literature demonstrates widespread variation in the opioid prescribing behaviors of medical providers, including differences in the specialties and locations of these providers. Likewise, the literature describes how the quality of medical school education affects the quality of opioid prescribing among providers, which is critical to recognize as the rate of medical school enrollment continues to increase. While academic institutions are taking individual approaches to opioid instruction, these approaches vary from school to school, and the resulting consequence is a lack of standardized opioid education. This is a grave concern because, among many other factors, this lack of standardization contributes to differences in prescribing behaviors among medical providers who graduate from different medical schools. Furthermore, variation in opioid education may also contribute to variation in perceived barriers, hesitations, and gaps in knowledge among medical students emerging into roles as practicing medical providers. This is a critical consideration as medical researchers, government agencies, and other organizations desperately continue to battle the ongoing opioid epidemic. As a result of considerations taken from the literature review, the research question of this thesis is: what perceptions and attitudes do medical students have regarding opioid education?

POSITIONALITY STATEMENT

To begin this chapter, I would like to briefly describe my own positionality. I believe that it would be helpful to share my positionality and, therefore, my lens on the research process and data analysis. Though I am not a healthcare provider, one of my main public health research interests include physician behaviors, specifically factors that influence prescribing practices. I offer the results from this study as only one possible interpretation of the participants' experiences based on my outlook as an educated, white woman who has an interest in understanding more about the opioid epidemic from a public health perspective. During my MPH training, I have conducted research using an intersectional approach including participants from diverse racial and ethnic backgrounds. As a qualitative thesis study, it is not my intention to generalize the perceptions and attitudes of opioid education for all medical students. In addition, I am not a medical student, so I understand that I could be considered an outsider to that community and might not relate to specific medical school experiences. However, my academic and professional background prior to enrolling in the Rollins School of Public Health included pre-medicine courses and immersive clinical experiences. It could be suggested that several commonalities between the participants and myself influenced the type and amount of data collected due to their comfortableness with me as a focus group moderator.

CHAPTER 3: METHODOLOGY

Introduction

The thesis was conducted in collaboration with a CDC Injury Prevention Research Center (IPRCE) funded research study titled "Improving Opioid Dispensing Practices to Mitigate Risks and Address Disparities" (CDC R49CE003072 (Rupp: Center PI; Giordano & Schenker: Pilot co-PI)). The Principal Investigators (PI) were Nicholas A. Giordano, PhD, RN of the Nell Hodgson Woodruff School of Nursing at Emory University and Dr. Mara Schenker (see Appendix A). The primary objective of this qualitative, descriptive study was to investigate themes regarding knowledge, concerns, and experiences regarding opioid dispensing and naloxone, a potentially life-saving, opioid-involved overdose reversal medication, among a diverse group of stakeholders, including patients and clinicians, by means of focus group discussions. As an extension of this study, the thesis sought to conduct focus groups with medical students to investigate their perceptions and attitudes of opioid education during medical school.

Population and Sample

The population of interest for this study was medical students and recent medical school graduates. To be eligible for the study, interested participants had to be 18 years or older, able to communicate in English, produce verbal and written consent, and have access to WiFi. Medical students were eligible to participate if they were currently enrolled in medical school and recent medical school graduates were eligible to participate if they graduated within the past two years. No individual was excluded from participating on the basis of gender, race, or ethnicity.

Procedures

A focus group is defined as a group discussion, guided by a facilitator, regarding a specific topic for the purposes of conducting data collection for research (Gill, Stewart, Treasure, & Chadwick, 2008). Focus groups prove to be useful for research purposes when there is a lack of existing knowledge of a particular subject, especially that of a complex and includes a number of variables (Powell & Single, 1996). Due to the lack of qualitative research concerning the perceptions and attitudes of medical students regarding the opioid education they have experienced in medical school, a focus group was beneficial in capturing such data.

Sampling and Recruitment

A multi-pronged, nonprobability sampling approach, including purposive and snowball sampling strategies, was used to recruit medical students. With the assistance of the PI, several medical students were identified as gatekeepers, who were able to provide assistance with recruitment by connecting with and informing other medical students of the focus groups who would have not been otherwise identified had it not been for an insider (Bailey, Hunter, & Hennink, 2020). As a result, there was a lack of coercion on the part of these medical students toward their fellow peers, as they were able to serve as a trusted source in providing information about the focus groups. Recruitment procedures shifted weeks into recruitment to deliberately sample medical students of color, after only white medical students participated in the first focus group, to ensure diversity among participants. These gatekeepers were provided with a statement to send out via email and GroupMe to fellow medical students who they believed would be interested (see Appendix B). The email contained a short summary of the purpose of the thesis, information about the focus groups, contact information, and the QR code that, once scanned, directed interested participants to the REDCap screener (see Appendix B).

Purposive sampling took place by engaging with information-rich individuals, identified within and outside of the research team, who fit the inclusion criteria and whose experiences align with the research goals (Campbell et al., 2020). Furthermore, snowball sampling was also used as a recruitment method for the medical student sample, as it allowed for the referral of interested participants from existing academic and social networks among medical students (Parker, Scott, & Geddes, 2019). For instance, one fourth-year medical student reached out to a second-year medical student to inform them of the focus groups, knowing that this student had an existing interest in the curriculum surrounding addiction medicine and harm reduction. Lastly, two fliers (see Appendix B) were placed in the student lounge in one medical school. This served as a recruitment strategy to advertise the focus groups to medical students and provided other important information, including a summary of the study purpose, contact information, and the QR code for the REDCap screener survey.

Though the REDCap screener included information for clinicians and patients to fill out as part of the larger CDC IPRCE-funded research study, there were selected sections designated for medical students to complete. The screener form prompted medical students to fill out a range of fields, including contact and demographic information, current student and job status, and focus group date availability. Depending on the responses received, interested participants were emailed and asked to confirm their availability for one of the focus group dates they indicated in REDCap, after which they were sent an Outlook Calendar invitation for the date and time with the Zoom link to the focus group. Interested participants were also sent an email with the link to the REDCap consent form, which was required to be electronically signed before they were able to participate in their scheduled focus group. Since the focus groups did not occur in-person, this was the first of two methods used to conduct informed consent, with the second

method taking place at the beginning of the focus group by asking their permission for the discussion to be recorded.

A reminder email was sent the morning of each focus group to the participants through the blind carbon copy (BCC) feature in Outlook Email. The focus groups took place on Zoom, a videotelephony software program that allows people to meet in a virtual setting, with a license provided through Emory University. Due to the virtual nature of the focus groups, participants were provided the choice if they wanted to have their camera on during the group discussion, and the vast majority of participants did have their camera on. Upon completing the introduction and informed consent, during which participants verbally indicated if they consent to being a part of the focus group, the focus group was recorded with their permission. Handwritten notes were taken on paper during the focus groups to assist with data collection and facilitation of the discussions. The recording was processed through the Zoom software, which automatically saved both the video and audio files of the focus group. After each focus group concluded, the video file was erased and the audio file was saved to the computer harddrive. Upon the completion of all focus groups, the total number of participants was reported to the PI, who completed an approval process to have a $10 Amazon gift card code sent to each participant who took part in the focus group as an incentive.

The size of the focus group was a significant consideration to account for when scheduling and conducting the focus groups. Though the optimal size of a focus group would consist of six to eight participants, focus groups ranging from three to fourteen participants could still allow for enriching and successful discussion depending on the topic (Gill, Stewart, Treasure, & Chadwick, 2008). Because recruiting medical students proved to be a challenge as a

result of their busy schedules, the goal was to recruit at least four participants for each focus group for the purposes of the thesis.

Data Collection

An open-ended, semi-structured focus group moderator guide was created prior to the first focus group, with the goal of collecting information-rich data and providing flexibility in facilitating focus groups (see Appendix C). The emic approach was taken during creation of the moderator guide and while conducting focus groups to enable discussion influenced by the perspectives of the population of interest by recognizing and appreciating their lived experiences (Spiers, 2000). The creation and maintenance of the moderator guide was an iterative process, being revised as needed upon the conclusion of each group discussion. For instance, a probe was added after the completion of the first focus group to encourage discussion of racial inequities due its importance in the literature surrounding the opioid epidemic.

Data Coding and Analysis Plan

Saturation of data, in which no new themes emerge from participant responses during data analysis, was an important consideration to account for when determining the number of focus groups to conduct. For the purposes of the thesis, saturation was defined as repetition of previously identified themes found during data analysis. After discussion with content and methodology advisors, it was anticipated that saturation would be reached after the conclusion of three focus groups with this participant population, so it became a goal to schedule at least three focus groups. Due to the various medical school education backgrounds of the participants, saturation may have been met regarding certain themes but possibly not met on others.

The audio files that were saved on the computer hard drive were transcribed by Otter.ai, a free transcription software that allowed the text to be uploaded to a password-protected Google

Drive folder. The researcher read the transcripts while listening to the audio file to ensure that all of the information was captured correctly by the software and including nonverbal sounds. During the review of the transcripts, any information specific to identities of the participants was redacted to ensure their privacy. The transcripts were then uploaded to MAXQDA (MAXQDA Standard 2022), a computer software that allows for coding of qualitative research data.

Thematic Analysis

Thematic analysis was chosen as the data analysis technique because it assists in the identification and investigation of themes, or patterns of data, that may be disseminated to report on qualitative research data findings (Braun & Clarke, 2006). Before coding in MAXQDA could occur, a codebook was developed to assist with data analysis. The codebook included code category names, sub-code names, definitions, and examples of quotes (see Appendix D). Similarly to the focus group moderator guide, there were ongoing revisions to the codebook as needed during the data analysis process. Both a deductive and inductive approach was taken when coding the transcripts in MAXQDA. Deductive coding assisted in laying the foundation for what codes and themes were expected to arise based on existing literature (Bailey, Hunter, & Hennink, 2020). Inductive coding occurred during the coding process by identifying themes that emerged through the data collection process may not have been immediately known (Bailey, Hunter, & Hennink, 2020). The definitions listed in the codebook assisted in open-coding for words, phrases, and ideas expressed by the focus group participants. Independent coding, rather than double-coding, took place due to the time-limited and single-researcher nature of the thesis project. The information-rich data from the focus group participants was analyzed for themes before writing the analysis.

Ethics

The researcher's CITI certification, of both the Social/Behavioral Focus and the Biomedical Focus, was completed before the start of participant recruitment and enrollment. The Emory University Institutional Review Board (IRB) approved the research protocol for the larger research study, STUDY00004163, and the information about the thesis was added as an addendum to the protocol at a later date (see Appendix E). The thesis met criteria for the IRB exemption under 45 CFR 46.104(D)(2). The participants of the focus groups were consented in REDCap before the start of the focus groups and verbally at the start of the focus groups.

CHAPTER 4: RESULTS

Introduction

The qualitative findings that emerged as a result of the utilization of a thematic analysis approach is described in this chapter. There were three focus groups that took place on Zoom on the dates of September 29, October 20, and November 3, 2022. The objective of the data analysis is to determine how the perceptions and attitudes medical students have regarding the opioid education they have experienced in medical school is influenced by their experiences at their respective institutions. In the analysis, demographic information of the sample is provided, followed by an in-depth thematic analysis of the key findings extracted from the focus groups.

Key Findings

Demographics

Table 1. Demographic information of focus group participants

Demographics	**% (N) or Mean (S.D.)**
Age	25.6 years (s.d. = 1.2)
Gender Identity	
Female	83.3% (10)
Male	16.7% (2)
Race/Ethnicity Identity	
White	75% (9)
Black/African American	25% (3)

Four participants attended each of the three focus groups, for a total of twelve participants in the sample. The average age of the sample was 25.6 (s.d. = 1.2) years old, and ten (83.3%) of the participants self-identified as women while two (16.7%) self-identified as men

(See Table 1). The majority of the sample consisted of white (75%) individuals, while Black/African American (25%) individuals made up the minority (See Table 1).

Code Frequency

Themes were coded in MAXQDA with the use of a codebook as a means of performing thematic analysis with the qualitative data present in the focus groups transcripts. Each code category contained corresponding sub-codes, in which the frequencies were recorded and presented in the following bar graphs. These graphs provide a quantifiable display regarding the abundance of themes discussed during the focus groups. In following figures, the number in black above each bar represents the total times the sub-code was present throughout all three focus groups, which assisted in providing a measurement of the overall abundance of different sub-codes throughout the focus groups. For example, Figure 8 demonstrates that preclinical coursework was the most often described modality of opioid education in medical school as reported by the participants, with extracurricular opioid education reported the least amount of times. Similarly, in Figure 9, support provided by medical providers was most often discussed during focus groups compared to support from faculty and peers. Furthermore, each bar is subcategorized by color, with the darkest shade of blue corresponding to the first focus group and the lightest shade of blue corresponding to the third focus group, and the number in white provides the frequency of the sub-code in each focus group. For instance, as seen in Figure 11, participants from the first and third focus groups discussed hesitations, barriers, and gaps in knowledge more often than the participants from the second focus group. While the following sections of this chapter describe the results qualitatively, graphical representations of the code frequencies may assist in providing a visualization of the findings that isn't only words and quotes.

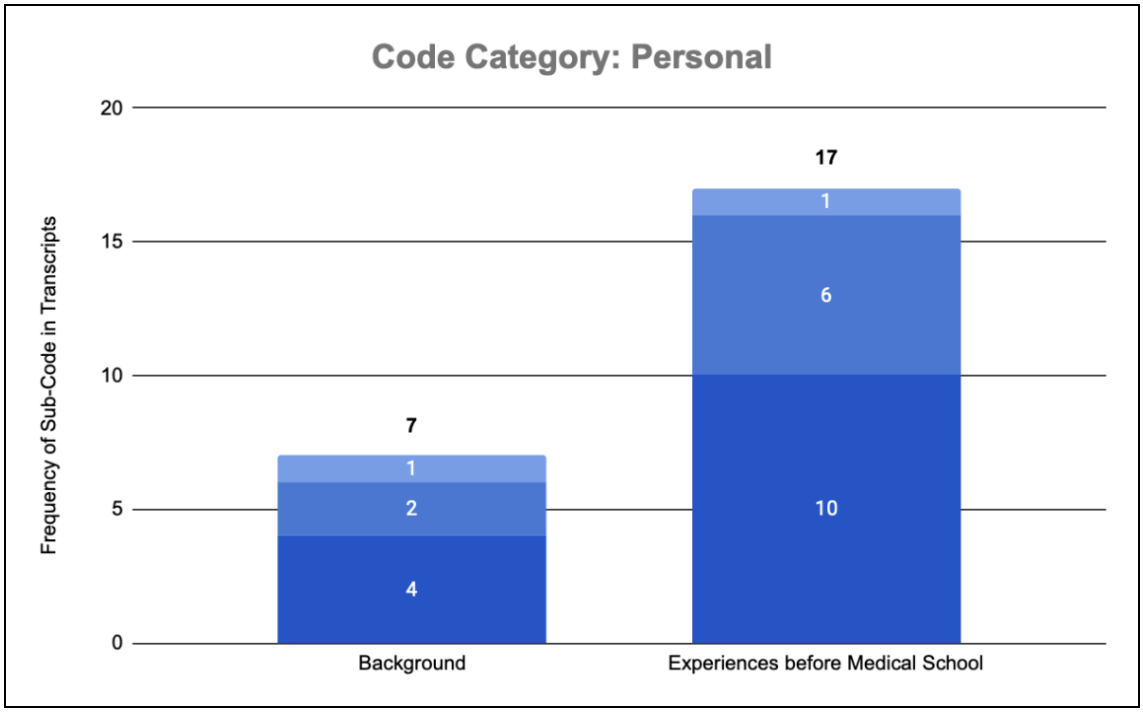

Figure 6. The frequency of sub-codes related to personal factors of the participants

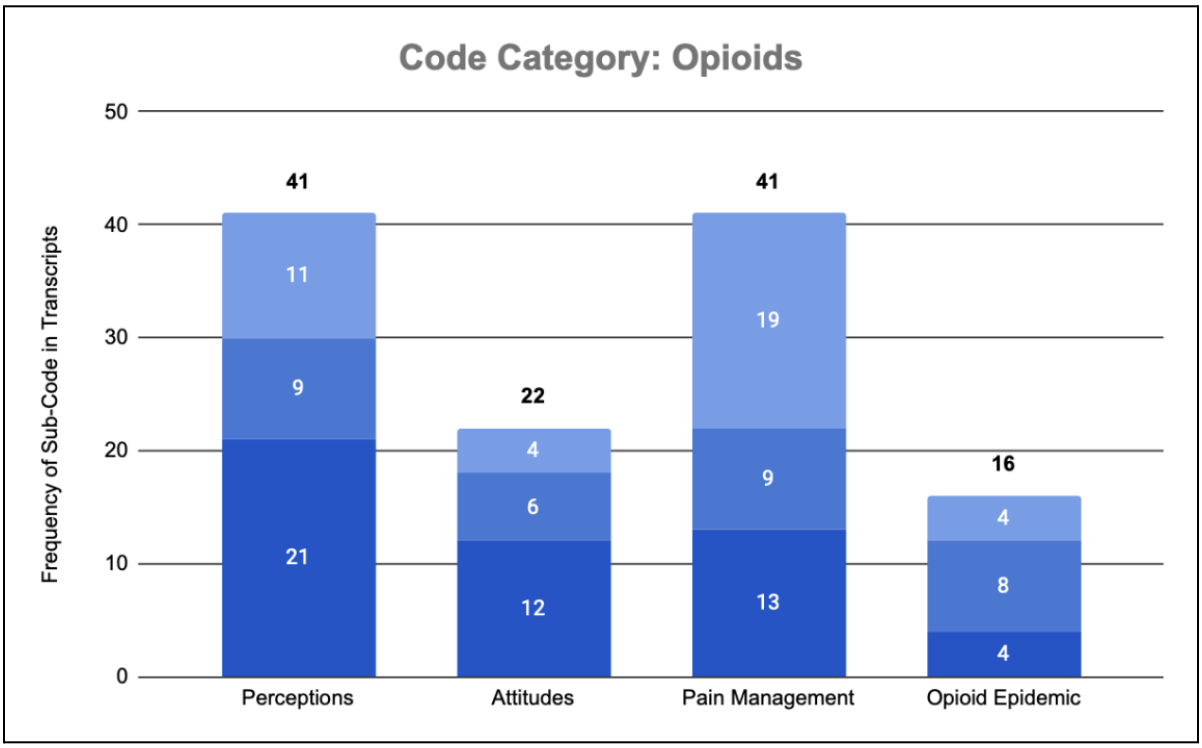

Figure 7. The frequency of sub-codes related to the participants' views of opioids

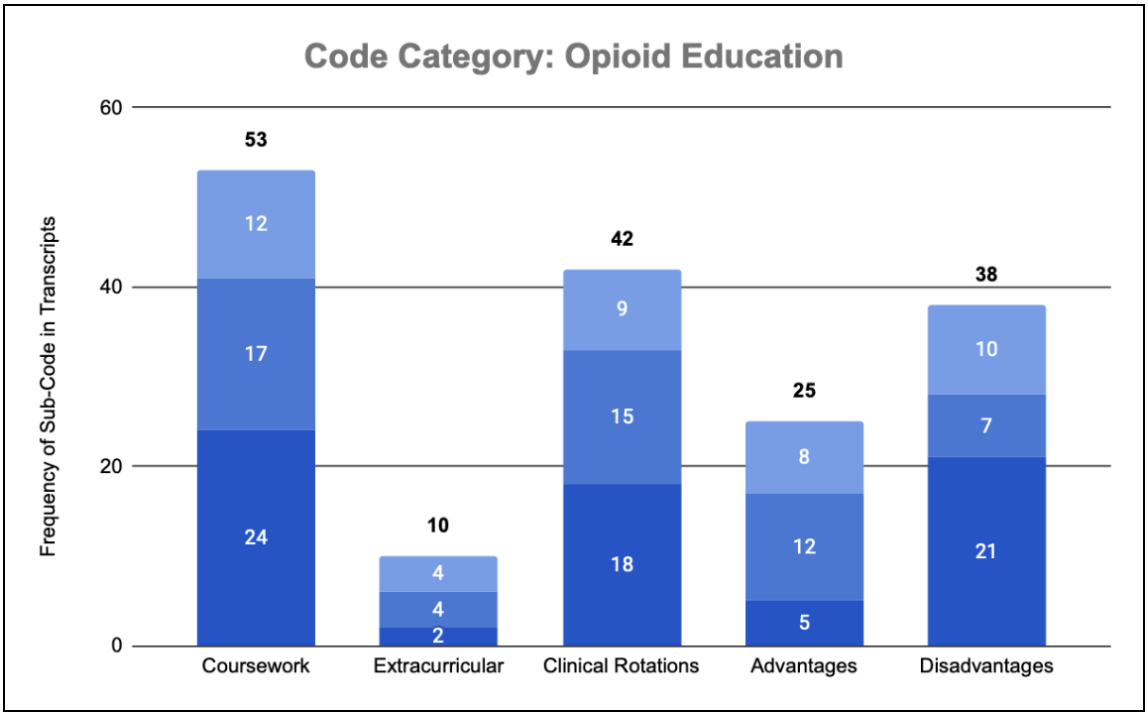

Figure 8. The frequency of sub-codes related to the participants' views of opioid education

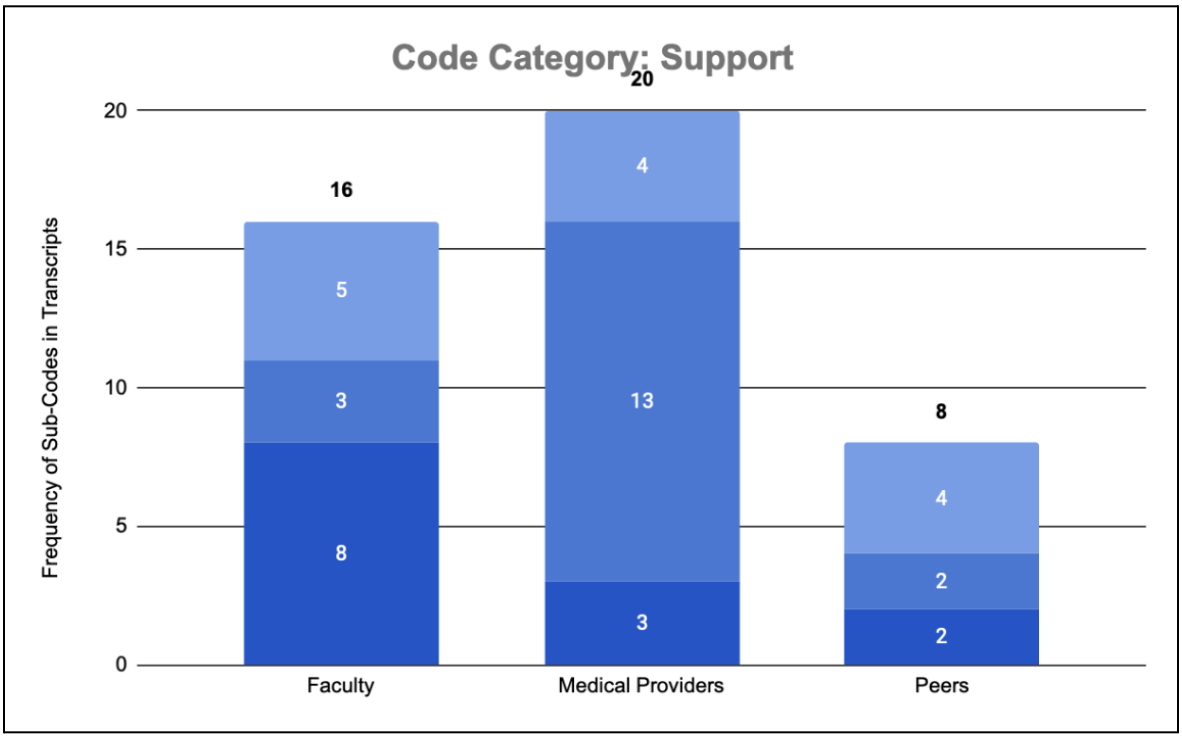

Figure 9. The frequency of sub-codes related to the participants' views of support related to opioid education

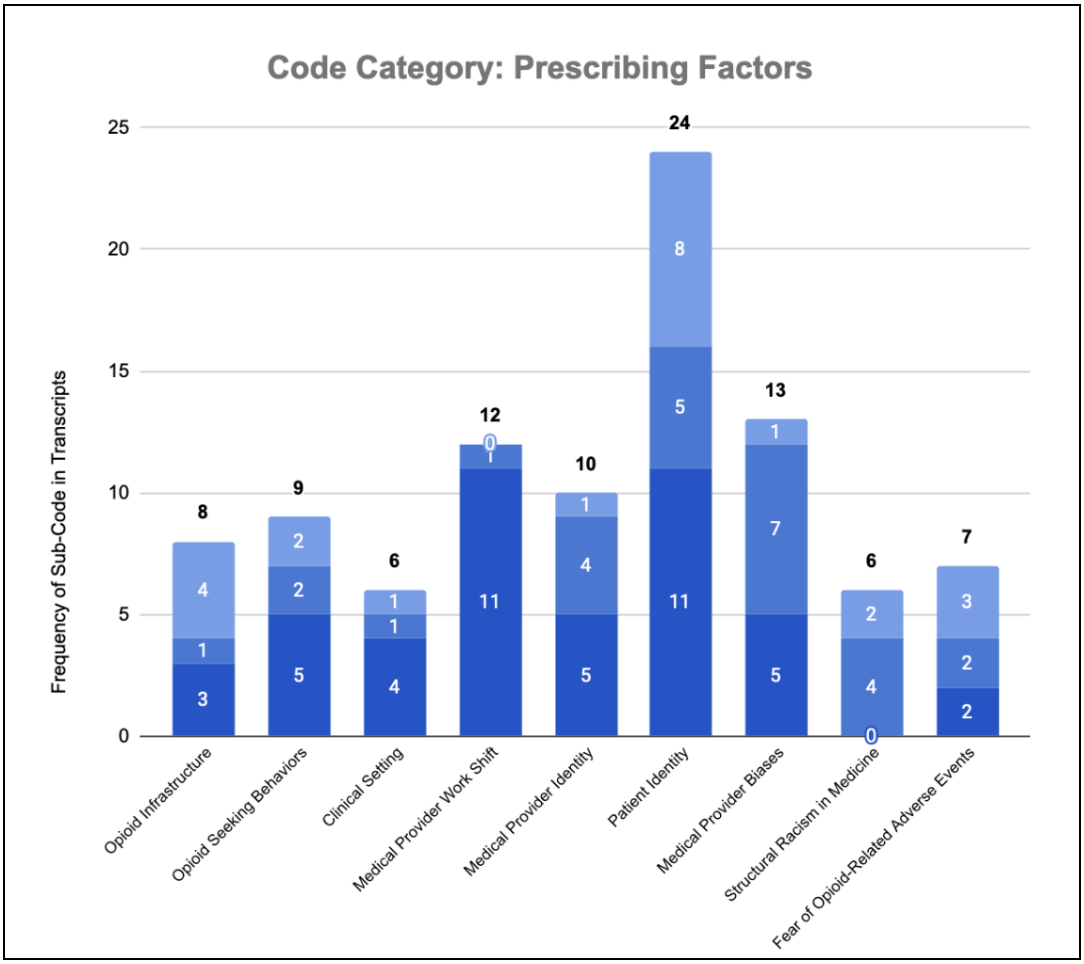

Figure 10. The frequency of sub-codes related to the participants' beliefs about factors that contribute to opioid prescribing

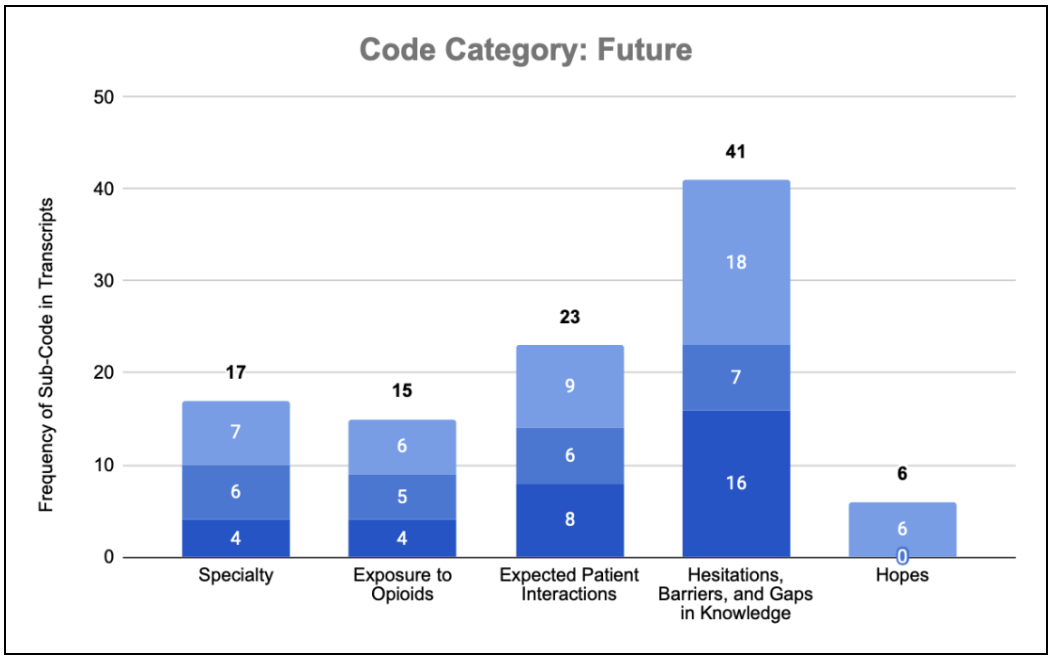

Figure 11. The frequency of sub-codes related to the participants' outlook of opioid-related matters in their future medical practice

Perceptions and Attitudes toward Opioids

I. Changes in Perceptions and Attitudes of Opioids Before versus During Medical School

Before discussing experiences of opioid education during medical school, it was important to first ask the participants how their perceptions and attitudes toward opioids have changed in recent years. Having experienced living in the U.S. during the opioid epidemic before and during the participants' medical school attendance, they have a unique lens when learning about opioids, unlike that of the majority of the general public. As a result, the participants were asked how their perceptions and attitudes toward opioids have changed since attending medical school.

Four participants expressed that, before they began medical school, they lacked a medical lens when viewing opioids, previously thinking of them as "just pain medication" (Participant 10, Focus Group 3) and "surgery pills" (Participant 9, Focus Group 3). Three participants

referenced that previous coursework and clinical experiences assisted in reducing negative connotations about opioids prior to attending medical school. For instance, one participant had "worked in emergency departments for about three years" (Participant 2, Focus Group 1) and another "at an orthopedic surgery practice" (Participant 1, Focus Group 1) prior to medical school, which provided them the opportunity to witness how opioids were being utilized and monitored to treat pain in patients.

Five participants referenced how the ongoing opioid epidemic had a substantial influence on their perceptions and attitudes toward opioids before beginning medical school. The term opioid had felt like a "buzzword" (Participant 6, Focus Group 2) for two of the participants, with one of them citing that it was mentioned during their "med school interviews" (Participant 7, Focus Group 2). One participant cited how stigma surrounding the opioid epidemic affected their way of thinking about them for some time, stating that they had previously "learned a lot of incorrect [like] bias" (Participant 5, Focus Group 2) about opioids from the rural community they were raised in. Participants described hearing the controversies surrounding poor regulation of prescription opioids and had negative connotations toward opioids before entering medical school. These controversies and subsequent perspectives were rooted in systemic misinterpretations and not clinical knowledge, a point well-summarized by one of the participants in the quote below.

> "Yeah I think before school my relationship was not from [like] a medical standpoint, it was more just kind of observing [like] how it was portrayed in the media and knowing some people who struggle with opioid dependence [umm] but not from a kind of medical lens."
> - Quote from Participant 4 during Focus Group 1

When asked to reflect on how their perceptions and attitudes toward opioids changed after beginning medical school, participants shared views that were a stark contrast to what they

had learned before medical school. Through their education and experiences during medical school, the participants expressed ways in which they now approach opioids through fact-based knowledge acquired throughout the last few years of medical school. This was well-summarized by one participant who stated that they felt like they had a "much more of… a scientific idea behind them now" (Participant 12, Focus Group 3). This approach to viewing opioids assists in understanding the usefulness of them to treat pain and that these are substances people "should have access to" (Participant 8, Focus Group 2) when medically appropriate.

> "I've also just learned more about like, 'okay, [like] there is a place for these drugs.' [like] Before I would have thought you just shouldn't prescribe it, people are going to become addicted."
> - Quote from Participant 6 during Focus Group 2

Through coursework and clinical experiences during medical school, the participants shared how their views toward opioids, specifically opioid addiction, have shifted as a result of learning more about the mechanisms that drive biochemical interactions in the body when exposed to opioids. As a result of this education, one participant stressed that learning these mechanisms had "opened my eyes more to the crisis of [umm] opioids and how easy it could be for someone to have an addiction" (Participant 11, Focus Group 3). The participants described how, by recognizing the severity of opioid addiction, they were "made much more aware of the prevalence of them and the potential dangers" (Participant 10, Focus Group 3) and that patients "don't have to be prescribed [like] an insane amount in order to become addicted" (Participant 9, Focus Group 3). The opioid education experienced in medical school was vital in altering the views medical students had toward opioids and, specifically, opioid addiction. Their new perspectives were fueled more by pharmacology lectures and less by misinformation in the mass media coverage of the opioid epidemic.

> "And I think what I learned and saw, when I was in medical school, were a lot of providers saying how they have to now regulate how they've been prescribing or giving out opioids because they're worried and people having a risk of becoming addicted. I think that was something that was tossed around a lot when it's like 'okay, I know this person is in pain, but what is the risk of them becoming addicted to these substances?'"
> - Quote from Participant 8 during Focus Group 2

While the participants expressed the importance of how learning more about opioids changed their perceptions and attitudes toward their use for pain management, it is crucial to highlight that there were missing aspects in their education that also contributed to shifts in views. This point was expressed in-depth during the first focus group more so than the others. Three students in that focus group believed that their opioid education missed the mark on providing a holistic approach to patient care. As a result of learning more about the biochemical nature of opioids, paired with clinical patient encounters, the participants felt that the "human element" (Participant 1, Focus Group 1) of the patient, the individual receiving the opioid prescription, was lacking. The participants expressed that the patient is an "actual person" at "the end of the day" (Participant 3, Focus Group 1), signifying a gap in patient care that is necessary when prescribing opioids. Furthermore, the participants in the first focus group expressed the importance of educating patients about the opioids they are prescribed and how this is vital in ensuring appropriate use of such potent medications. One participant cited that they recall becoming "a bit more irritated by the lack of educating patients about their medication" (Participant 2, Focus Group 1) when they witnessed emergency medicine settings, arguing that "if we spent more time with the patients there would be less problems long term (Participant 2, Focus Group 1). This was an interesting finding because, while the focus of the discussion is on opioids and opioid education, current medical students discern the importance of the patient, who will be directly affected by opioid prescribing, an apparent change in beliefs compared to before

they began medical school.

> "... who is the person behind [like] this disorder? And I feel like a lot of the times in medicine, and also the way we're taught, [like] we're not really taught about [like] the person behind it… And, I don't know, I feel like that often gets [like] forgotten that [like] there's [like] a person behind all of this and [like] that should really be [like] at the forefront of the conversation in my opinion."
> - Quote from Participant 3 during Focus Group 1

II. The Opioid Prescribing and Pain Management Balancing Act

The ability to balance benefits and risks associated with prescribing opioids is a cornerstone of the CDC's clinical practice guideline for opioid prescribing (Dowell et al., 2022). The term "balancing act" has even been used to describe this phenomenon in the literature (Gold, 2017; Rosenfeld, 2020) surrounding this topic. The idea that opioid prescribing should be conducted in a way that successfully addresses pain and minimizes risk of adverse events was mentioned a total of nine times throughout the three focus groups by five different participants. In fact, three participants across two focus groups (Participants 5, 9, and 12) specifically stated the word "balance" when describing this phenomenon, as seen in the quote below.

> "So I think that you have to balance the fact that pain management is important and is critical for patients to actually begin to heal. [umm] But also making sure you can figure out ways for the patient to have some sort of [umm] stability and post-discharge care and follow-up socially to make sure that it's not something that they are going to become hooked on."
> - Quote from Participant 12 during Focus Group 3

The participants in the focus groups discussed that, though opioids may lead to harmful side effects and addiction, they can also be especially effective in managing symptoms of pain and are "substances that [patients] should have access to" (Participant 8, Focus Group 2) for various medical conditions, procedures, and surgeries. With that said, as they progress through medical school and are exposed to information about opioids throughout the semesters, the

participants recognize the “importance of them but also the inherent damage that they can do” (Participant 12, Focus Group 3). The “responsibility to not just prescribe the pain medications blindly” (Participant 2, Focus Group 1) of medical providers to maximize patient safety and minimize harm was stressed by participants throughout the focus groups, who recognize that, upon graduating medical school, this will become their responsibility as well. As a result, a balancing act exists for medical providers “making sure you're giving patients the care that they need and deserve versus not [umm] contributing to a problem” (Participant 9, Focus Group 3). This delicate phenomenon is understood by the participants, with one medical student stating that the responsibility is “a very challenging balancing act, but an important one to take on” (Participant 5, Focus Group 2).

The participants anticipate this responsibility of balancing pain treatment with risks involving opioid misuse in their future practice. One participant explained that they “hope that we find ways of maximizing [umm] the accessibility of it in ways that aren't harmful as well” (Participant 12, Focus Group 3). As they anticipate patient encounters in their future practice as medical providers, the participants remark on how they will manage this balancing act while considering patient medical history and their knowledge as the medical provider. A participant posed a plausible situation in which balancing benefits and risks of opioids could be approached during a hypothetical patient interaction and medical team discussion, seen in the quote below.

> “And you do kind of have to talk to them a little bit about like, ‘hey, these are some of the drugs that we use. These are why we use them. This is how we expect these things to work and the surgical team, I guess, will kind of manage you afterwards and make sure that [stuttered in speech, repeated dialogue] make sure that what we did to make you comfortable kind of doesn't do too much damage with what they're trying to do.’”
> - Quote from Participant 8 during Focus Group 2

Regarding their current perceived quality of preparation for this responsibility, overall the

participants felt that they feel underprepared going into their residency program, but anticipate that they will be "learning a lot of things on the fly" (Participant 1, Focus Group 1). Meanwhile, one participant expressed hesitancy in that they don't know how much "is considered safe, but also reasonable and also ensures that the patient is comfortable and not putting them at risk" (Participant 2, Focus Group 1). This uncertainty affects how they view opioids and opioid prescribing as medical students, well-summarized in the quote.

> "I think my biggest gap in knowledge right now is how opioids can be used successfully without [like] the outcome of addiction because just with experience and then the little bit of [like] clinical exposure I've gotten it's all been in reference to addiction but obviously there's [like] use for these medications and they have really good benefit for people and can be [like] prescribed in a responsible way."
> - Quote from Participant 5 during Focus Group 2

Insight on Opioid Education during Medical School

I. Knowledge and Experiences Developed during Preclinical Semesters

The participants shared various modalities in which they learn about opioids during their preclinical semesters of medical school. Many of these experiences took place in the classroom setting under the instruction of faculty members at their respective medical schools. Several of the participants reported that they learned about opioids during required pharmacology lectures, though the material they learned differed slightly. For instance, only one participant reported that this included a pharmacology lecture in which the instructor "talked about Narcan… and [like] showed us how to use it" (Participant 10, Focus Group 3). In the classroom setting, collaborative student group work was also a way in which the participants learned and applied knowledge to opioids in mock situations. For example, one participant experienced "a small group, you know, conversation about [like] a problem-based [umm] case, where that way [like] opioid prescribing was mentioned and talked about a little bit" (Participant 7, Focus Group 2). Though most of the

instruction was provided by an instructor affiliated with their respective medical schools, a participant shared that they received "two lectures from the Director of New Jersey Poison Control," who provided talks on "overdosing, naloxone, as well as kind of the misconceptions of overdosing" (Participant 12, Focus Group 3). While participants were able to describe what they found beneficial regarding opioid education during preclinical semesters, several expressed that there were areas in which the quantity and quality of opioid education was lacking.

> "Yeah, I agree with what [**redacted name of Participant 3**] said about [like] [**SOM name redacted**]'s [umm] preclinical. I really don't feel like I got [like] any education on opioids. I think there are [like] places you could work it in, like when you're learning [like] pharmacology [like], you know, and you're learning about these drugs [like] connecting to [like] the real world of [like] prescribing habits and issues [umm] you could face [umm] with those drugs and kind of the challenges."
> - Quote from Participant 4 during Focus Group 1

The perceived quality of the opioid education the participants have received in medical school can be drawn upon by the subjective accounts they shared regarding what they have learned. While participants highlighted the importance of learning about certain material related to opioids, the value of information wasn't as highly regarded. For instance, one participant described how their preclinical curriculum of opioids was "mostly geared towards mechanism of action and [like] memorizing a list of side effects" without the "relative importance of the side effects" (Participant 9, Focus Group 3), which was also recalled by another participant in the quote below.

> "I very much second that point about the mechanisms more just so the [umm] 'here's what the drug is, here's what it does, and here are the different once's. And that's great. Move on to the next part of pharmacology.' Not really the importance of the dangers and everything."
> - Quote from Participant 10 during Focus Group 3

The literature shows a lack of standardization in opioid education among medical schools

in the U.S. (Singh & Pushkin, 2019), which was revealed in the data, particularly in the first and third focus groups. Though the names of medical schools were redacted from the transcripts as an added measure to protect privacy, the findings show various experiences of opioid education, especially during preclinical semesters. For instance, in the first focus group, one participant recalled that the material they learned "wasn't even that comprehensive" and there was "very outdated training" (Participant 3, Focus Group 1), and the participant that spoke next remarked how their education was different, having "had several lectures on how to prescribe, when to prescribe" (Participant 2, Focus Group 1) from pharmacist instructors during pharmacology lectures. While one participant (Participant 2, Focus Group 1) expressed learning about opioids during their first year of medical school, another (Participant 8, Focus Group 2) recalled learning about opioids during their second year as clinical rotations approached. In response to the quote above from the participant who experienced a lecture on Narcan (Participant 10, Focus Group 3), another student expressed that the only reason they learned how to use Narcan was through a student-run initiative at their respective medical school, in which the participant received "more information from those sessions than I had [like] with the curriculum structure" (Participant 5, Focus Group 2). Similarly, another participant in a different focus group mentioned an experience they had in which information received from outside the mandatory curriculum had more of an impact on their learning about opioids, highlighted in the quote below.

> "There weren't any particular moments in the curriculum itself that stuck out. But of opportunities that came up from [like] medical school groups, medical student groups, that I went to [umm] two of them where people shared their stories about their loved ones who passed away from opioid use and those moments really stuck with me, but they weren't part of the actual curriculum."
> - Quote from Participant 11 during Focus Group 3

II. Knowledge and Experiences Developed during Clinical Semesters

Medical student participants described instances in which opioids were taught, discussed, or used during their clinical rotations, which occur during the second half of medical school at most US institutions. Concerning the transition from preclinical lectures to clinical rotations, some participants expressed feeling unprepared to encounter opioids in clinical rotations due to the lack of opioid education provided during preclinical semesters. One participant expressed that they didn't feel "prepared [umm] to encounter that in a clinical setting with [like] real patients" based on what they learned during preclinical semesters, feeling as though they were "relearning it again" (Participant 7, Focus Group 2).

In medical school, there are a variety of clinical experiences medical students are required to complete before graduating. The participants described how they learned about opioids during certain clinical rotations, though the experiences varied from person to person. One participant stated that, during their internal medicine rotation, they learned about opioids from "interns and residents about [like] actually applying [like] these drugs to different patients" (Participant 6, Focus Group 2), which they stated as a contrast to the mechanism of action approach of education they experienced during their preclinical lectures. In contrast, another participant explained they felt like opioids weren't "really something that was emphasized" (Participant 10, Focus Group 3) in their surgical rotation's curriculum. Another participant highlighted an instance in their surgical rotation when a patient, who had a history of opioid addiction, was being prescribed opioids as the result of a surgery, stressing the fact that it was important that their pain would be "adequately managed regardless" (Participant 11, Focus Group 3). With regards to treating OUD, one participant's experience observing a doctor in a methadone clinic made them think about how they, as a medical student, are "trained so much on

[like] diet and smoking and alcohol and less on the opioid stuff" and that conversations with patients "felt really difficult to try to have" (Participant 2, Focus Group 1).

Across the three focus groups that took place, two participants in two different group discussions referred to the importance of their medical school's required palliative care rotation when learning about opioids during clinical education. When prompted with the question, "could you describe the education you've received regarding opioids during these experiences?", one participant stated that they thought that their palliative care rotation was where "most of the clinical education around opioids is focused" (Participant 9, Focus Group 3). One participant was close to beginning their palliative care rotation at the time of the focus group. This participant expressed that they anticipated the importance of patient conversations with severe chronic pain, stating that they were expecting doctors "to be a little more kind of [like] mindful and holistic to their approach" (Participant 4, Focus Group 1). Aspects of the "mindful and holistic" approach involved in-depth patient conversations about their opioid prescription as well as the practice of prescribing Narcan concurrently with an opioid prescription to patients, especially those with a history of OUD or SUD. One participant commented on their experiences of observing such practices in clinical settings, comparing what they observed in their palliative rotation compared to others, in the quote below.

> "And then also, that's where we do a lot of [like], why you should always prescribe Narcan even if you're only prescribing a weak opioid or something like that. [umm] But then, so that's [like] I think is really strong in that rotation, but then if you move outside of the palliative care world, I think the lessons that we learn in the palliative care rotation aren't necessarily followed by all attendings, [like] they're not really modeling that behavior consistently."
> - Quote from Participant 9 during Focus Group 3

The participants of the focus groups, as described in previously stated results, understand that they will be practicing medical providers in the midst of the opioid epidemic. As a result,

they have expressed their experiences of learning, or not learning, how to use Narcan in their studies and the balancing of recognizing the benefits and risk of opioids when managing pain. These were likely important factors that influenced the way in which participants perceived the quality of opioid education received during clinical rotations. The following quote was an interesting finding, as it related to their perceptions related to opioid misuse and overdose risk alongside physician behaviors observed in clinical rotations.

> "But [like] one thing I know is that [like] you should prescribe Naloxone when you have [like] over a certain dose or [like] you have [like] benzodiazepines as well. And there have been [like] a number of times either, like an OPEX [*outpatient experience*] or [like] in wards or shadowing where [like] the doctors just [like] won't do it, [like] co-prescribe Naloxone. Or when [like] I asked if they've ever done it, they just kind of [like] dismiss the question. Or [like] even sometimes I've seen [like] it pop up, like oh, you should also [like] add this prescription and they [like] almost [like] reflexively, [like] click through it [like] they almost know it's gonna pop up and [like] no matter where to put their cursor already to [like], just get rid of [like] the window message. So [like], it's either they don't know they should do it, they don't want to deal with it, they don't [like] see the importance of it. And that goes back into [like] us not knowing how to have conversation with patients about [like] the potentially [like] deadly and addictive medication that they're being prescribed even though they might [like] need it. And also [like] current attendings not knowing or [like] just not wanting to have that conversation either. So [like], and then that trickles down to us, because then they're the ones [*stuttered in speech, repeated dialogue*], so we can't learn from someone that doesn't know how to do it or do it themselves."
>
> - Quote from Participant 3 during Focus Group 1

Four of the twelve participants identified as preclinical medical students (Participants 3, 5, 8, and 12), so they were not able to speak on experiences of opioid education in clinical rotations. However, one participant noted that, as of that moment, they "definitely don't feel prepared" to enter clinical rotations with the opioid knowledge they received thus far in preclinical coursework. However, they continued, they may feel more "prepared after attending upcoming [psychiatry] lecture" (Participant 5, Focus Group 2).

III. Types and Quality of Support Systems

Regardless of learning about opioids in the classroom or clinical setting, the participants shared instances of immediate or continuous support provided to them by educators and peers. Through recollection of instances in the classroom, participants described how, if the instructor was more passionate about the material, the support they received when learning about opioids was better. These experiences stuck out to the participants because the perceived severity of opioids was taken more seriously when instructors "were really passionate" (Participant 9, Focus Group 3). Discussing opioids with peers was another way in which the participants felt supported in the classroom setting. For instance, when the focus of the "small group discussions [like] our PBL [*problem-based learning*] group" (Participant 9, Focus Group 3) was opioids, the participants found the conversations helpful in better understanding opioid addiction and supportive resources that exist for those with OUD. Similarly, one participant also described how learning about opioids alongside pharmacology students was also beneficial when receiving opioid education in medical school (Participant 2, Focus Group 1). Throughout their experiences receiving opioid education, the participants described feeling more supported with certain topics than others. For instance, one area that a participant felt very supported in was assisting with providing treatment during an overdose, such as how to administer Narcan, as well as the "signs and symptoms [umm] that we should recognize" when they believe someone is experiencing an overdose (Participant 10, Focus Group 3).

> "... for me, the preclinical side, the different instructors who did talk about it, were very passionate about it and very knowledgeable about it. [umm] And they kind of acknowledged to us that most work [*stuttered in speech, repeated dialogue*] in most cases it's not going to be followed correctly because the world isn't [like] a perfect place. [umm] But they did talk about different resources, different ways of addressing patients to discuss pain medication and pain management. And they also gave us resources just [umm] when it comes to weaning off opioids, I guess, as well."

- Quote from Participant 12 during Focus Group 3

While there have been instances of beneficial support regarding opioid education, there were also instances in which the participants felt there was an absence of support. Feelings associated with a lack of support resulted both in the absence of material or instruction that the participants perceive to be important when learning about opioids. For instance, while Participant 10 described in the previous paragraph that they felt supported in treating an overdose, they did not feel supported in learning about the "prevention of an overdose in the first place" or gaining "more knowledge about the drugs and [like] prescribing them and everything." Regarding educational resources about opioids provided by their respective medical school, they are "pretty generic" (Participant 4, Focus Group 1). One participant reflected on their studies during preclinical semesters, and expressed that they believe they did not effectively learn about the challenges related to opioid prescribing because "the emphasis on that teaching isn't there as much in the curriculum" (Participant 4, Focus Group1). Similarly, during clinical rotations, one participant recalled not feeling supported in learning about appropriate opioid prescribing from clinical educators because they "didn't model the behavior," such as prescribing Narcan concurrently with an opioid, due to a perceived "lapse in knowledge… or consideration" (Participant 9, Focus Group 3). Though a lack of support varied depending on the setting, one participant expressed their thoughts when reflecting on the larger picture of opioid education in medical school, as described below.

"But I still felt as if a huge part of it was kind of trying to have that wow factor where [like] it kind of hits you in the face and you think about opioids for that week, and maybe next week but then it's never brought up again, really. And I think that's kind of where the problem at least in my program was, is that they do a decent job of making sure that they covered the material, but it's not brought up ever again. So, I mean, yes, you might get a question here and there [umm] about it on exams as well in the hospitals, but at the end of the day, you don't,

> you're not kind of aware of the difficulties with opioids or how to manage them beyond [like] the one week intensive that we do on that."
> - Quote from Participant 2 during Focus Group 1

Another interesting finding related to the experiences of one participant, who recalled their previous efforts in advocating for better quality opioid education at the medical school they attend. This participant described how, when discussing the importance of improving what and how opioids are taught in the curriculum, they had left feeling "less than supported" by the faculty at the medical school they attend (Participant 3, Focus Group 1). While they acknowledge that some of the faculty were supportive of having these conversations, they described how they were "met with a ton of resistance" from the majority of faculty, including interacting with some "very nasty deans… with very serious biases" (Participant 3, Focus Group 1). This was important to highlight, as it demonstrates the significance and urgency medical students feel toward receiving quality opioid education while they are in medical school, while also demonstrating push-back that the students may be receiving.

Though it was anticipated that faculty support would be the primary focus of these findings, it was interesting to find that there was a strong appreciation for the support the participants have received from peers, specifically through one school of medicine's addictive medicine interest group. While one participant expressed their direct involvement with this specific interest group (Participant 3, Focus Group 1), three other participants that participated in different focus groups (Participants 5, 9, and 11) expressed how they have felt very supported by the interest group in their learning of opioids from their fellow peers. They described how the students leading the interest group "have really been supportive and awesome points of contact for learning more" about opioids (Participant 5, Focus Group 2). Furthermore, the interest group puts on harm reduction workshops that, while not enforced or directed by the medical school,

have provided support during preclinical semesters regarding opioid education (Participant 9, Focus Group 3), which included the distribution of Narcan and education about the signs and symptoms of an overdose (Participant 11, Focus Group 3). While some of this education was provided by the medical school, one participant stated that they "remember it better from the harm reduction meetings" than from their medical school coursework (Participant 11, Focus Group 3). These findings demonstrate the beneficial impact that peer-led education has had on medical students' learning about opioids during their time in medical school.

Focus group discussions about the quality of support also prompted suggestions on how to improve the nature of support surrounding opioids in medical school. As a result of the intense nature of medical school, participants expressed that they have received general support regarding their education and wellness while progressing through medical school, so specified support for something as specific as opioid education may "fall by the wayside" (Participant 1, Focus Group 1). However, because opioid education is "not [like] standardized… across the med school curriculum" (Participant 7, Focus Group 2), building support for it may be "something that [like] probably can be addressed" (Participant 1, Focus Group 1). As seen in the quote below, one student describes the impact that different qualities of opioid education support during medical school may influence the types and amounts of information they garner about opioids, which further impacts variations of opioid knowledge during and after attending medical school.

> "... maybe it could be looped through different threads throughout the curriculum, or [like] in different modules, per se, because I think that's how everything's broken up. Because if you have to go to an interest group, or do this and see something, everyone might not get the same exposure."
>
> - Quote from Participant 8 during Focus Group 2

Future Opioid Prescribing

I. Current Perceived Preparedness for Future Prescribing

When asked to reflect on preparedness to "encounter opioids when [medical students] enter residency," there were similar response patterns across all focus groups. Seven (Participants 1, 4, 5, 6, 7, 8, and 9) of the twelve participants stated that, while they currently feel underprepared, they expect that they will gain knowledge and confidence interacting with opioids as they progress through residency. For example, three participants described how, with the "support of a team" (Participants 5, 7, and 8, Focus Group 2), they will feel more equipped in making opioid-related decisions during clinical practice. They described how, depending on the hospital or organization they are accepted to, they will learn more about how that practice prescribes opioids, describing the beginning of this process as a "learning curve" (Participant 4, Focus Group 1). This was an interesting finding because, though it does not directly relate to education experienced in medical school, it does relate to a form of ongoing education that is regarded as equally if not more important than what and how they are taught in medical school. The quote below illustrates that, while they expect to learn more about opioids during residency, one participant understands that the quality of what they will learn may be greatly influenced by the clinical environment they become immersed in.

> "But something that worries me, particularly with opioids, is that I think a lot of things are just done because that's how they've been done. And so I worry about [umm] kind of with the stress of residency and seeing a bunch of patients [like] having that energy and competence to question how things are being done and what is the correct way, or maybe a more responsible way."
>
> - Quote from Participant 9 during Focus Group 3

Though it was well-recognized that they will learn more about opioids during residency, there were certain aspects of opioids that some participants felt somewhat prepared and

unprepared to encounter before entering residency. Some participants raised concerns specific to information they have not received, or have not yet to receive, during medical school. One participant shared that they feel like they knew "nothing about dosages" (Participant 11, Focus Group 3) and do not expect to learn about it before entering residency, and another expressed that, while they didn't feel comfortable at the moment, that they would learn more during an upcoming emergency medicine rotation (Participant 12, Focus Group 3). Three participants across two focus groups (Participants 2, 3, and 5) discussed how they feel comfortable approaching the subject of opioids with their future patients as a result of practiced patient conversations they experienced during medical school. While these practice conversations seem to bolster their confidence when approaching the conversation with patients, they concurrently understand that each patient encounter will differ in their clinical presentation. For instance, patients will differ in their willingness or resistance to have these conversations with them (Participant 2, Focus Group 1), so it will be vital to "meet them where they're at" (Participant 3, Focus Group 1). These findings are similar to the earlier perception participants had regarding the importance of considering the "human element" when prescribing opioids to patients, seeing these conversations as an important aspect of patient care.

> "I do think that [umm] we get a good education with how to approach the subject and build rapport with patients and I really appreciate that and [like] all the training we get on how to [umm] just understand [like] all the [like] factors that go into addiction and just the reframing it's been very helpful for me coming from that background that was [like] very conservative, very rural and yeah, I'm relearning some of those schemas, I guess."
> - Quote from Participant 5 during Focus Group 2

II. Anticipated Hesitations, Barriers, and Gaps in Knowledge for Future Practice

When the participants were asked if there were "any hesitations, barriers, or gaps in knowledge that you are concerned about as you think about prescribing opioids in your future

careers?", they recalled various important topics related to opioids. The participants most frequently discussed hesitations concerning opioid prescribing in their future medical practice than they did anticipated barriers or gaps in knowledge. Hesitations surrounding opioid prescribing were expressed both in terms of an individual's thoughts and behaviors toward their patients as well as environmental or systematic factors or influences. This was an important finding because it demonstrates that, whether the participants knew it or not, they were rationalizing their hesitations across levels of the socioecological model, ranging from the macro-societal level all the way down to the individual level. For instance, though participants acknowledge that, especially during the beginning of a residency program, that they should not "do anything that you don't feel comfortable with" (Participant 12, Focus Group 3), there are external factors or influences out of one's control that may warrant concern when prescribing opioids during the participants' future practice.

The evolving nature of the opioid epidemic signaled to the participants that the "standards of care are also changing for opioid administration," highlighting the importance of staying "up to date" on opioid regulations (Participant 12, Focus Group 3). Understanding that much of their patient care ends at discharge, participants expressed concerns regarding long-term care for the patients that "are sent home on opioids" (Participant 8, Focus Group 2) during their future medical practice. For instance, understanding that they may not be the doctors providing their patients with continuous, long-term care for chronic pain, one participant noted that a concern they have is "losing contact with a patient that had a prescription and not knowing a week or two weeks out how they're feeling about their usage" (Participant 8, Focus Group 2). Similarly, another participant expressed the importance of their patients "having that support" (Participant 7, Focus Group 2) outside of the hospital to decrease the risk of adverse outcomes

due to opioids. These were interesting findings because the participants highlighted the importance of thinking about the patient external to the prescription pad.

Understanding the stigma surrounding opioids in the US, the participants highlighted the importance of evaluating one's self as they prescribe opioids in their future medical practice. For instance, the participants described the importance of "evaluating… my own biases" (Participant 4, Focus Group 1) and not allowing "stereotypes or [like] fears" (Participant 6, Focus Group 2) that would affect patient care. Similarly, the participants expressed hesitations related to encounters and conversations with patients, understanding the importance of the "duty to have a conversation with them about [like] a really serious medication that could have really serious [like] side effects or [like] deadly outcomes" (Participant 3, Focus Group 1) if opioids are misused. When implicit biases and assumptions are evaluated, the participants expressed how it may inform decision-making during patient interactions, such as being able to identify if patients are "malingering" and "not actually in this pain" (Participant 6, Focus Group 2). Regarding the interpersonal interactions with their future patients, the participants wanted to be mindful of "trying to have that conversation with the patient, but not really highlight the stigma so that they don't feel as if they're being stigmatized" (Participant 2, Focus Group 1) keeping in mind the negative connotations that exist in society due to stigma surrounding the opioid epidemic. There is the concern that patients may "assume that [like] I think the worst of them" (Participant 3, Focus Group 1) because they are willing to have conversations about opioids with them. Regarding patient conversations, an interesting point was raised by one of the participants in the quote below.

> "But then my other concern is finding the time and being honest with myself to make sure that I find the time to have those conversations because when you're running around trying to be patient after patient and your pager is beeping, do you really [*stuttered in speech, repeated*

dialogue] it's easy to say now, but in ten years, do you really take the time every time to have those conversations with the patient? And [umm] I think currently we don't really do it at all to be quite honest. [like] I've been on the patient-side and you wake up from surgery and you're in pain and someone just pushes pain meds into your IV and you have no idea what they gave you and you can ask, but [like] then when you're being discharged, you know, the doctor wrote a prescription for you but [like] did they tell you what they're going to prescribe you? Not really, the nurse comes and tries to have that conversation. [umm] I do think it's more [*stuttered in speech, repeated dialogue*] there's more responsibility, there should be an on us on the actual physician to have the conversation before they prescribe instead of just writing the prescription and expecting the nurse to have time and to take [*stuttered in speech, repeated dialogue*] to take the time to really have the conversation with the patient. And I think one of my concerns is trying to be honest with myself to make sure that I do have those conversations throughout the career."

- Quote from Participant 2 during Focus Group 1

Participants described several ways in which they anticipate encountering barriers, specifically perceived obstacles and challenges, when prescribing opioids in their future medical practice. One participant shared how, when they begin practicing medicine, an anticipated barrier will be the lack of initial experience conversing with patients, not having practiced long enough to recognize "little details down of [like] who needs this much versus who needs that much and who do I have [like] longer conversations with versus who do I not have to have those conversations with" (Participant 1, Focus Group 1). Referring to this practice as the "art of doctoring," they describe how "not everything's [like] going to be cut and dry right out of a textbook… figuring out the little variations, patient to patient, on how to best manage somebody with opioids" (Participant 1, Focus Group 1). While participants have stated that they anticipate learning more as they progress through residency, it was interesting to find that their perceived lack of patient experiences concerning opioids was viewed as a hindrance in their initial medical practice. In addition, another participant described the "infrastructure around [umm] prescribing opiates" (Participant 9, Focus Group 3) as a barrier in their future practice. They expressed that

heavy regulations surrounding opioid prescribing may lead those who are in pain, but thought of as medication-seeking, to be "pushed aside" (Participant 9, Focus Group 3), highlighting a systemic influence that may contribute to individuals receiving necessary treatment for their pain.

The participants expressed their perceived anticipations regarding the types of knowledge they believe they may still lack about opioids by the time they begin their medical practice. For example, one participant expressed that, by the time they graduate, they anticipate that they still won't understand the "differences between types of opioids," further describing how the extent of what they know about treating pain with an opioid is that "fentanyl is really potent and strong in a small dosage" (Participant 11, Focus Group 3). Similarly, another participant described that an anticipated gap in their knowledge when beginning their clinical practice will be to know "which one, what dose, [like] how many days is [like] safe" (Participant 10, Focus Group 3) when prescribing opioids to their patients. The idea of the "balancing act" reemerged during this discussion in one of the focus groups, as one of the participants stated that they don't feel they will know "how opioids can be used successfully without [like] the outcome of addiction" (Participant 5, Focus Group 2) by the time they enter a residency program. These quotes and others similar to them highlight the participants' perceived value of responsible opioid prescribing when they themselves become practicing medical providers, which is likely in part influenced by the ongoing opioid epidemic in the U.S. Overall, it was common for participants to state that, though they anticipate entering their medical practice with gaps in their knowledge of opioids, they anticipate that they will continue to expand their understanding as they progress throughout their residency.

III. Perceived Factors that Influence Opioid Prescribing

Toward the end of the focus group discussions, participants were asked if they could describe factors that they perceive influence opioid prescribing behaviors among medical providers. Similar to the previous question, the participants' responses to this question spanned across the socioecological model, signifying their processing of these factors on a wide range of levels of influence. The majority of the points raised involved opioid prescribing factors related specifically to the prescriber, that being the physician or similar medical provider. This finding did not come as a surprise, considering medical students become providers themselves upon graduating, though it was still interesting to know that they were able to place themselves in the mindset of physicians when considering personal factors that would influence opioid prescribing behaviors. For instance, one participant described how a "provider's implicit bias," on the basis of race for example, may influence how they assess the "pain symptoms presenting" in their patients (Participant 5, Focus Group 2). These implicit biases may be garnered by "personal experiences or assumptions… from life outside of medicine" (Participant 7, Focus Group 2) that may govern the way medical providers make decisions regarding if and how to prescribe opioids to their patients. Regarding a provider's clinical practice, another participant raised the point that the "number of years that someone has been in practice would also sort of affect [like] how likely they are to prescribe something" (Participant 6, Focus Group 2), hypothesizing that younger medical providers may be more conservative in their prescribing as a result of less relative experience.

The topic of physician burnout and workload arose throughout the focus group discussions, both in the context of this question and during other parts of the focus groups. When asked about opioid education in their clinical rotations, one participant made the comment that

they could “get a second-hand sense of [like] the burden that [like] prescribing opioids puts on” physicians, remembering the “feeling that you see doctors have when trying to prescribe opioids” (Participant 1, Focus Group 1). This was an expected point of discussion when asked about factors that affect prescribing, seeing as how the participants have observed providers in clinical settings and, therefore, may anticipate experiencing burnout to some extent in their future careers. The participants described burnout as “certainly a factor” (Participant 1, Focus Group 1) regarding opioid prescribing behaviors, and this was discussed in the context of how it affects medical providers personally as well as how it influences the interactions they have with patients. For instance, due to “being tired” from “long shifts” and feeling “pulled in every direction” by colleagues, medical providers may be willing to prescribe an opioid to their patients that they have “prescribed to other people, numerous times” (Participant 2, Focus Group 1) in the past assuming that it will work. They describe how burnout can govern opioid prescribing if a physician is feeling very overwhelmed and “didn't have time or just didn't have the energy or the bandwidth really to sit down and have like a thirty-minute conversation with the patient” (Participant 2, Focus Group 1), which may have drastic consequences on the patient receiving the prescription.

The interpersonal interactions medical providers have with their patients, as described by the participants, may also introduce factors that influence the way in which these providers choose, or do not choose, to prescribe opioids. For example, though a patient does not have a history of substance use, if they have an “extensive family history of addiction to opiates” (Participant 2, Focus Group 1), they may guide the prescribing decisions of the provider. Similarly, one participant noted that considering both medical and non-medical aspects of the patient’s life is crucial to take into account when prescribing opioids, such as asking questions

like “are they living with addiction, are they experiencing homelessness… what kind of follow-up they’re gonna get” (Participant 12, Focus Group 3). The subject of the conversations providers have with their patients may also sway decision-making regarding opioid prescribing. For instance, medication-seeking patients, which had been previously mentioned earlier in the focus group discussions, was revisited during this question as well. The participants had mentioned how, depending on “what patients ask for” (Participant 9, Focus Group 3) in terms of prescriptions, medical providers may perceive them to be seeking an opioid prescription and not someone who is truly in pain. In the quote below, one participant made an interesting point that one interaction with a patient perceived to be medication-seeking may influence the manner in which a provider regards the presentation of pain in patients they see afterward, which may also influence opioid prescribing behaviors.

> “You kind of are affected by the patient you just saw before you go see the next one, so if you're spending all this time with someone who is drug seeking and insistent on getting all of the [umm] strongest drugs, although they don't need it, you might be worn out and then you go to the next patient who is actually in pain and you're kind of just dulled by the previous conversation and you're not really treating their pain as much because of that.”
> - Quote from Participant 2 during Focus Group 1

Though it was present in the minority of responses provided by the participants, they were able to describe factors on the organizational and macro-societal levels of the socioecological model that influence opioid prescribing behaviors among medical providers. Regarding the healthcare in the US, one participant mentioned the issues of “understaffing of hospitals” (Participant 2, Focus Group 1), which may exacerbate other individual or interpersonal behaviors related to prescribing, including burnout and time constraints for how long a provider has to speak with their patients. Regulatory and institutional pressures on medical providers were also mentioned as a factor that influences opioid prescribing, one

participant noting that due to developments in electronic medical records and monitoring systems, that “there's a series of boundaries [umm] that providers have to go through to make sure that they can actually prescribe this important medication” (Participant 12, Focus Group 3), which may influence if they are willing to prescribe knowing the steps that will have to be taken. Also, there may be differences between a medical provider’s personal prescribing behaviors and the expectations of the institution they work for, with one participant describing this as “battling it from both [like] an institutional [like] side and then also the individual learned [like] experiencing” (Participant 5, Focus Group 2).

Lastly, the impact that systemic racism has on the medical field was mentioned by four participants across two focus groups (Participants 5, 7, 8, and 12). The participants highlighted that the “structural racism that definitely exists” (Participant 12, Focus Group 3) in medicine has an effect on how medical providers perceive and interact with their patients. Though there are a vast array of modalities in which racism disadvantages people of color in medicine, the interpersonal dynamics between provider and patient was highlighted by the participants during the focus groups. For example, one participant noted that racism may influence opioid prescribing behaviors in the forms it “can consciously and unconsciously affect [the physician’s] behavior” (Participant 7, Focus Group 2). Similar to the discussion earlier regarding implicit bias, the racial identity of a patient may affect the likelihood that a medical provider is willing to prescribe an opioid, which has been illustrated in the literature (Pletcher, Kertesz, Kohn, & Gonzales, 2008; Rambachan, Fang, Prasad, & Iverson, 2021). One participant highlighted that, due to systemic racism in medicine, there is a barrier toward “equitable prescription of opioids” (Participant 5, Focus Group 2).

“… the only differences that I've seen are [like] racial and ethnic [umm] backgrounds,

> influencing who got prescribed opioids, and I don't know if that's going to change because I don't know if, like she said, the overarching [like] structural racism that you see in medicine is going to change. Even if you change the way you approach opioids, there are people who have other biases and beliefs that still are going to inform who they feel like is in pain, who they feel like it's more likely to become addicted or less likely to become addicted."
> - Quote from Participant 8, Focus Group 2

IV. Future Hopes about the Opioid Epidemic

The medical students who participated in the third focus group were asked a question at the end of the focus group that was not originally written in the moderator guide. They were asked if there was anything that they were hopeful about regarding "the future of opioid prescribing, especially going into the medical field in the midst of the opioid epidemic." There were various responses from the participants, and all were well-informed by their knowledge and perceptions toward opioids. For instance, understanding the evidence-driven nature of medicine, one participant stated that they are "hopeful for continued research and hopefully new ways of managing chronic pain" (Participant 11, Focus Group 3) as a way to offset the opioids-only option current providers may feel when managing pain. Similarly, another participant stated that they hope the opioid epidemic will continue to "prompt more education on it" (Participant 10, Focus Group 3) so that there is a more conscious effort when prescribing opioids in future medical practices. Specifically regarding future opioid prescribing, one participant stated that they were "more worried than optimistic" (Participant 12, Focus Group 3) in ensuring that those who are in pain are receiving the treatment they need. The reactiveness of the participants to cautiously approach the opioid epidemic with evidence-based knowledge rather than influence from external forces was evident, especially in the quote provided below.

> "I guess it's definitely introduced a more healthy skepticism of [like] pharmaco- [*stuttered in speech, repeated dialogue*] pharmacology companies… I think that, [like] as horrible as this

> entire epidemic is, I'm hoping that it'll prevent a future one, that we're just more skeptical of incoming medications and kind of really digging into what the research is saying rather than what the salespeople are saying."
> - Quote from Participant 9 during Focus Group 3

Summary of Findings

In summary, it is first important to mention that, when thinking about opioids as a pain relief medication, the participants reference the importance of approaching opioids with both a scientific and humanistic lens. Generally, the opioid education provided during preclinical semesters involved the pharmacology of opioids as well as learning the side effects and biochemical mechanisms. In contrast, opioid education encountered during clinical semesters involved observing how opioids were utilized for pain management in patients. Regarding both preclinical and clinical opioid educational experiences, however, participants felt that there was a lack in both quality and quantity of information provided, which impacted how they perceived the standard of opioid education they received while in medical school. When reflecting on the education they have received both in preclinical and clinical semesters, there was variation in the types and quality of education provided, signifying a lack of standardization of opioid education across different medical schools. Though there were a variety of anticipated concerns and factors raised regarding future opioid prescribing, the participants expect to receive further education about how opioids are applied in their chosen speciality upon entering and progressing through their residency program. As a result of the opioid education they have received in medical school, the participants were able to rationalize concerns and factors that would impact prescribing across the socioecological model.

CHAPTER 5: DISCUSSION, IMPLICATIONS, AND RECOMMENDATIONS

Introduction

This qualitative study was designed to investigate the perceptions and attitudes of medical students concerning the opioid education they have received during medical school. To our knowledge, this is the first focus group study that has been conducted with medical students exploring their experiences on the opioid education they have received during medical school.

Summary of Study

Qualitative research methods were utilized to collect data-rich narratives from medical students during focus group discussions. An open-ended, semi-structured focus group moderator guide was developed to facilitate a discussion with medical students about their insights and experiences regarding the opioid education they have received in medical school during their preclinical and clinical semesters. Additionally, the participants were asked to share their thoughts about prescribing opioids in their future careers, including apprehensions they may have. Thematic analysis was used to analyze data, deductively and inductively code, and conduct a subsequent analysis in MAXQDA.

Discussion of Key Results

The focus group participants emphasized the impact that medical school had on their perceptions and attitudes toward opioids. Prior to medical school, participants had formed perceptions of opioids based on the stigma and stereotypical media representation of the opioid epidemic. The participants described how this influenced the way they thought about opioids, both when used as prescription pain relief medication or recreationally. Since enrolling and progressing through medical school, the participants described the importance of taking a scientific yet compassionate approach to opioids as a pain management medication. Several

participants recognized the delicate balance involved in prescribing opioids, acknowledging that opioids can effectively manage pain but may have harmful side effects and risks of addiction. Participants stressed the responsibility of medical providers to maximize patient safety and minimize harm when prescribing opioids, recognizing the need as the medical providers to carefully consider patient medical history and opioid-related knowledge. Participants anticipate this responsibility in their future practice and hope to find ways to maintain accessibility to opioids without causing harm.

The opioid education they received in medical school, during both preclinical and clinical semesters, focused on the pharmacology, side effects, and biochemical mechanisms of opioids. However, the participants felt that the quality and quantity of information provided were insufficient during their preclinical semesters. There was also a lack of standardization of opioid education, at which peer support and storytelling by patients and families affected by the opioid epidemic was more beneficial in their learning about opioids during medical school than support provided by faculty or clinical educators, which was an interesting finding not found in previously conducted research. Participants also noted that opioid education tends to occur in a single block of medical school, with little repeat exposure throughout the clinical years. Although the participants raised concerns and factors related to future opioid prescribing, they expected to receive further education on how to prescribe opioids in their chosen specialty during their residency program. Based on the opioid education they received, the participants were able to consider various socioecological factors that might impact prescribing, ranging from individual biases to societal stigma.

Strengths and Limitations

Strengths

The focus group nature of the data collection allowed medical students to provide in-depth narratives when answering questions posed by the moderator, contributing to the quantity and quality of the data. Their individual thoughts and experiences would not have been captured nearly as well through the use of quantitative methods, such as a survey with multiple choice and close-ended questions because of the limited manner in which their lived experiences could be reported rather than being provided room to freely express. Similarly, in a focus group setting, the participants were able to remark on points brought up by their peers, contributing to the richness of the data. Though the sample size was relatively small (n=12), the small focus group size allowed for individualized rapport building with the participants and promoted a sense of trust between participant and researcher. This may have assisted with enhancing the participants' comfort in answering questions posed to them during the focus groups.

Limitations

It is first important to note that, though a considerable amount of data was collected from three focus groups, it is likely that saturation of all anticipated themes was not reached. If more time and resources were available, more focus groups could have been conducted without the constraint of completing data collection within several months' time. While Zoom focus groups provided participants with the ease of participating during interviews in their own space, it made it difficult for the moderator to observe body language external to the webcam frame. Concerning the nature of the focus groups, response bias may have also been a factor in the quality of responses, meaning they may have felt inclined to respond to questions in a way that would be desirable to the moderator. Therefore, response bias may have altered the accuracy of

responses provided by the participants during the focus groups.

Implications and Recommendations

Public Health Implications

As previously stressed, the opioid epidemic is a considerable public health threat in the U.S., with no end in sight. The syndemics theory suggests that the opioid epidemic is not simply an individual issue but rather a result of several external factors from social and physical environments that interact to increase the likelihood of disease burden (Mendenhall & Singer, 2020). Sydemics theory has three core features. Firstly, multiple diseases may coexist within a population, which is known as comorbidity or multimorbidity. With opioid use, it is important to recognize that there is a strong association between OUD, as well as other SUDs, and psychiatric conditions (Bogdanowicz et al., 2015). The complex nature of how these conditions may exacerbate one another, contributing to one's health burden, must be further explored. Secondly, there is a form of biological, social, or psychological interaction between these diseases, which can range from biological interactions to anthropological observations. As reported in the literature, individuals who use opioids are at increased risk of unfavorable health outcomes if there is a presence of other structural disadvantages, such as low socioeconomic status and a lack of income, education, health insurance, or social support (Van Draanen et al., 2020). Thirdly, recognizable large-scale social factors exist that result in clustering of diseases, including systemic oppressions and policies. Systemic racism in medicine is a critical consideration when discussing the opioid epidemic, as racial minorities in the U.S. are less likely to be prescribed an opioid due to racial bias (Pletcher, Kertesz, Kohn, & Gonzales, 2008; Rambachan, Fang, Prasad, & Iverson, 2021) yet these same groups have experienced an increase in the burden of disease as a result of the opioid epidemic (Furr-Holden, Milam, Wang, & Sadler, 2021).

Though it seems bleak to hypothesize about the future of the ongoing opioid epidemic, there have been several hopeful actions in terms of government policies. The administration of President Biden has enacted changes designed to collect comprehensive, real-time data of opioid overdoses to provide communities with necessary information to respond appropriately. The "Non-Fatal Opioid Overdose Tracker" website is updated on a biweekly basis with county-level data for the purpose of tracking non-fatal opioid overdoses to alter medical responses when clusters of overdoses occur (Mann, 2022). Likewise, under the Biden administration, the Department of Health and Human Services is providing over $1.6 billion in grants to aid communities across the U.S. as a means of addressing addiction and overdose crises, which are part of the administration's overall effort to prevent overdoses and save lives (HHS.gov., 2022). Though beneficial government-level interventions are an important part of the solution, variations in opioid education during medical school and, as a result, myriads of opioid prescribing behaviors will continue to be a critical driving force of the opioid epidemic. Therefore, it is critical to consider recommendations that may build on data surrounding medical student experiences learning about opioids in medical school to develop initiatives to increase its quality and, furthermore, drive future safer opioid prescribing behaviors.

Recommendations

I. Recommendations for Future Research

The findings from this study demonstrate a variety of medical students' opinions and experiences regarding the opioid education they received during their preclinical and clinical semesters. This data serves as feedback for medical schools interested in improving their opioid-related instruction. Additional research is needed. For example, a mixed-methods approach could be used to understand medical students' experiences across the U.S. at a range of

institutions. Survey and interview data could be collected on the effectiveness of certain lectures or rotations regarding opioids when encountered during medical school. Collecting the insights and experiences of medical students across different medical schools would be a useful way to learn about medical students' perceived benefits and drawbacks when learning about opioid education for the purposes of curriculum remodeling. As opioid education is not currently standardized in the US, this is worth determining where gaps or issues in opioid education may be present.

II. Standardization of Opioid Education in U.S. Medical Schools

The literature shows the presence of ongoing concerns surrounding the lack of standardized opioid education across medical schools in the U.S. (Singh & Pushkin, 2019). It is known that the methods used by medical schools to expose their medical students to areas of opioid education can differ. One study found 19 distinct teaching methods and 8 different evaluation methods that were present across 102 medical schools (Howley, Whelan, & Rasouli, 2018). Efforts to standardize opioid education, however, are worth noting, as it supports the notion that it is possible. Suggestions for improving the quality of opioid education during medical school have included increasing educational opportunities for clinical exposure, simulations, interdisciplinary learning, individualized prescriber feedback, and addiction management (Singh & Pushkin, 2019). As discussed in Chapter 2, Massachusetts implemented ten core competencies that medical students across the state's four medical schools must comprehend before graduating, including the ability to assess pain symptoms and addiction risk, among other skills (Karon, 2017). While standardizing opioid education across all medical schools may present a variety of challenges, it is a worthwhile endeavor to ensure that all medical students have the necessary skills to address this critical public health issue. As

demonstrated by Massachusetts, by implementing efforts towards a standardized approach, medical medical schools may better equip future physicians to manage opioid use safely and effectively, ultimately improving patient outcomes.

Conclusion

The results from the study indicate that there is room for improvement in the instruction of opioid education to medical students in the U.S. and that students themselves are eager for enhanced education in this area. Although the research conducted for the thesis only reflects the perceptions and attitudes of a relatively small group of medical students, it demonstrates a desire for medical students to learn more about opioids, a promising sign as the opioid epidemic progresses. Consequently, it is up to the university to consider investigating potential curricular reforms for their medical students. While a plethora of factors interplay to impact the state of the opioid epidemic in the U.S., increased quality and standardization of opioid education in medical school could help improve opioid prescribing behaviors and, as a result, mitigate the risk of opioid misuse, dependence, and overdoses.

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APPENDIX A: IPRCE PROTOCOL

PROTOCOL TITLE: Improving Opioid Dispensing Practices to Mitigate Risks and Address Disparities

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FUNDING SOURCE: CDC Injury Prevention Research Center

REVISION HISTORY

Revision #	Version Date	Summary of Changes
1	03/14/2022	Updates made include specifying security and confidentiality of the qualitative data and non-English speaker exclusion.
2	05/26/2022	Updating inclusion criteria to include clinicians in training
3	07/12/2022	Updated the protocol to include a zoom option given the increased COVID cases

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1. Study Summary

Study Title	Improving Opioid Dispensing Practices to Mitigate Risks and Address Disparities
Study Design	Qualitative descriptive study using focus groups
Primary Objective	Elucidate themes regarding concerns, experiences, and knowledge about opioids and naloxone among a sample of diverse patient and clinician stakeholders.
Secondary Objective(s)	Design prototypes of novel opioid medication warning labels utilizing thematic findings. Characterize reactions to novel opioid medication labels from patient participants and clinicians.
Research Intervention(s)/Interactions	60 to 90 minute focus group
Study Population	clinicians, future clinicians, patients on long-term opioid therapy, and opioid naïve patients

Sample Size	90 to 120 clinicians and patient participants
Study Duration for individual participants	60 to 90 minutes
Study Specific Abbreviations/ Definitions	CDC, centers for disease control and prevention
Funding Source (if any)	CDC Injury Prevention Research Center

2. Objectives

The objective of this study is to develop prototypes of novel opioid medication warning labels. The design of these labels will be informed by leveraging themes identified from focus groups conducted with both patients and clinicians. We will recruit patient participants, who are either opioid-naïve or on long-term opioid therapy, as well as clinicians from one of the largest level 1 trauma centers in the nation and an affiliated academic medical center. During the conduct of this exploratory qualitative descriptive study our interdisciplinary team aims to:

Aim 1: Elucidate themes regarding concerns, experiences, and knowledge about opioids and naloxone among a sample of diverse patient and clinician stakeholders.

Aim 2: Design prototypes of novel opioid medication warning labels utilizing thematic findings.

Aim 3: Characterize reactions to novel opioid medication labels from patient participants and clinicians.

3. Background

Opioid–involved overdose death rates have risen rapidly without abatement, specifically among non-Hispanic Black adults whose rates have doubled that of Non-Hispanic white adults in recent years.(Cano, 2021; Furr‐Holden et al., 2020; Lippold, Kumiko & Ali, 2020; Lippold, Kumiko M. et al., 2019) Over 87,000 Black and Hispanic adults died from an opioid-involved overdose over the past two decades, with 12,595 deaths in 2019 alone.(Kaiser Family Foundation, 2021) Individuals of all races living in lower income areas are twice as likely to die of an opioid-involved overdose compared to individuals in more affluent areas.(Altekruse et al., 2020; Marshall et al., 2018; Pear et al., 2019; van Draanen et al., 2020) Unfortunately, 2020-2021 is anticipated to be the deadliest period ever for opioid-involved overdoses and public health reports will undoubtedly continue to reflect these racial, ethnic, and economic disparities.(Kuehn, 2021) There remains a chasm between members of marginalized communities and communities of color, compared to affluent individuals or non-Hispanic white adults, in accessing multimodal pain management and naloxone, a potentially lifesaving

overdose reversal drug.(Groenewald et al., 2018; Hoffman et al., 2016; Jones et al., 2021; Kuppermann et al., 2015; Madden & Qeadan, 2020; Morales & Yong, 2021; Mossey, 2011) Upstream interventions designed in partnership with and for patients that are applicable in settings where opioid medication is frequently dispensed, such as orthopaedic trauma care settings, are urgently needed.

Patients with limited financial resources and those who do not identify as non-Hispanic white adults are particularly vulnerable to experiencing poor outcomes following orthopaedic trauma, such as persistent pain and reduced physical functioning.(Driesman et al., 2017; Haider et al., 2013; Portenoy et al., 2004; Sheridan, E. et al., 2019) As the opioid crisis continues to worsen, patients experiencing orthopaedic trauma, such as fractured bones, face increased opioid-related risks.(Holman et al., 2013a; Koehler et al., 2018; Schoenfeld et al., 2017; Von Oelreich et al., 2020) Orthopaedic trauma patients are particularly vulnerable to develop chronic pain and prolonged opioid medication utilization, across all races and socioeconomic classes.(Edgley et al., 2019; McCrabb et al., 2019; Shymon et al., 2020) For example, up to 20% of orthopaedic trauma patients requiring surgery report prolonged opioid utilization beyond 3-months postoperatively.(Basilico et al., 2019; Holman et al., 2013b; Mohamadi et al., 2018) Individuals prescribed long-term opioid therapy, specifically at high doses, are at increased risk for experiencing an opioid overdose.(Glanz et al., 2019) Despite the use of prescription opioids declining over the past decade, often at the expense of effective pain control for patients, orthopaedic trauma care pain management continues to be centered around opioids.(Boddapati et al., 2021)This significant overlap in chronic pain and prolonged opioid utilization, paired with the volume of patients who identify as racial minorities or are from lower income brackets experiencing orthopaedic trauma, places importance on implementing solutions to increase opioid safety education and naloxone dispensing for patients in orthopaedic care settings to diminish existing inequities. Yet current efforts to reduce opioid-related risks in acute care settings are not patient centered. Opioid research and regulation have largely targeted prescribers, with the goal of reducing the number of pills prescribed.(Meisenberg et al., 2018; Olfson et al., 2020) A focus of these initiatives have been on regulating volume and frequency of prescribing. Outcomes from these initiatives have been questionable, at best, on reducing overdose deaths.(Bohnert et al., 2018; Finley et al., 2017)

In 2020 the Food and Drug Administration (FDA) mandated pharmacies include labeling on opioids instructing patients and caregivers to discuss naloxone with their clinicans.(Food and Drug Agency, 2020) To date, the effectiveness of this mandate on patient outcomes has yet to be studied. The mandate does not outline how to optimize labels to effectively communicate opioid-related risks. This is of concern given how infrequently medication warning labels are read by patients, the lack of understanding and biases many patients and clinicians have of naloxone, and limitations due to health literacy.(Binswanger et al., 2015; Kerensky & Walley, 2017; Nathan et al., 2007; Raynor & Knapp, 2000; Sheridan, S. L. et al., 2011; Wolf et al., 2011) Therefore patients with lower health literacy may not benefit from this mandate aimed at mitigating opioid-related risks. Research focused on improving medication dispensing practices that are patient-centered are urgently needed to prevent exacerbating inequities related to opioid safety and access to naloxone that have persisted during the ongoing opioid public health crisis.

4. Study Endpoints

Participants will be asked to attend a 60 to 90 minute focus group.

5. Study Intervention/Design

To develop the novel opioid medication warning labels, we will use a qualitative research design that utilizes data collected during focus groups to examine current experiences with opioid dispensing and labels to inform the design of novel labels, similar to our prior research.(Duong et al., 2021a; Owusu et al., 2020; Popova, Neilands et al., 2014; Popova, Kostygina et al., 2014; Yang et al., 2019) Using a semi-structured interview approach for the focus groups will allow for the recognition and identification of thematic concerns, experiences, and knowledge about opioids, opioid-related risks, and naloxone across a diverse population of clinicians and patient participants.

6. Procedures Involved

Potential participants will be referred to the PI and study staff by Dr. Schenker, who will screen individuals for eligibility and engage them in the informed consent process before enrolling them and inviting them to attend a scheduled focus group. The PI (Dr. Giordano) and Co-I (Dr. Popova) will lead all focus groups, with the support of graduate research assistants. Focus groups are expected to last approximately one hour, but can be extended to a maximum of ninety minutes. Interviews will be conducted in a private, quiet room at Grady or over a secure video conferencing platform hosted on Emory servers, specifically Emory licensed Zoom. Three focus groups per participant target population will be held to elucidate themes to inform the development of the labels. After working with a technical graphic designer to develop the prototype labels, we will conduct one additional focus group with each target population to characterize reactions to the sample. Since the start of the COVID-19 pandemic, our team has successfully conducted dozens of focus groups in multiple studies (Duong et al., 2021b; Loud et al., 2021; Massey et al., 2021; Popova et al., 2021). Semi-structured interview guides, consisting of questions and probes to stimulate discussion and conversation will be developed into a field guide. The guide will contain focused interview question developed to facilitate conversation between participants for data collection. Doing so will capture the lived human experience of the participants, thus contributing to credibility.(Krefting, 1991; Sandelowski, 2000). Focus groups will be recorded using a digital recorder that will be on the table or if on zoom plugged into the computer and the interviewer will write field notes during and immediately following the sessions. Videos will not be recorded, only sound via the recorders. The interviewers, through the use of pseudonyms, will maintain confidentiality when transcribing. Data from the recorders will be downloaded directly to Emory's firewall protected servers and deleted from the digital recording device. The digital MP3 files will remain on the Emory secure server during transcription. Transcriptions of the focus groups will remain on the servers. Any hard copies of the transcriptions will be stored in a locked cabinet in the PI's office at Emory Nursing.

This research will be exploratory, aiming to identify key concepts for developing and refining opioid warning labels and potentially redesigning dispensing containers. Topics in the interview guide that will drive focus groups (Aim 1), which will include: a) Beliefs about the effects of opioids; b) Mental schema of addiction for different products; c) Cognitive and emotional reactions to existing opioid warning labels. Participants will first provide individual evaluations

of existing warnings, using both open text and Likert scale responses, by filling out a paper-and-pencil survey, followed by group discussion. This quantitative assessment gives the opportunity to obtain data from the more introverted participants who may not express their opinions out loud. Participants will be provided pill containers, markers, labels, and stickers to design warning labels during the discussions and to help visualize their perspectives on safe dispensing. Next, mock warning labels will be designed in partnership with the investigators and a technical graphic designer based on themes identified from the data gathered during focus groups (Aim 2). We will leverage cross-cutting themes that emerge across focus groups and mock labels produced by participants to guide our consultation with the graphic designer. Criteria for label designs include language is appropriate for a 6th grade reading level and color-blind friendly palettes. The investigators will convene an additional 2 focus group with each target participant population to assess reactions to the novel opioid warning labels from patient participants and clinicians (Aim 3). Feedback between these additional focus group will be used to refine labels prior to conveying an additional focus group. Again, participants will first provide individual evaluations of warnings, using both open text and Likert scale responses, by filling out a paper-and-pencil survey, followed by group discussion.

7. Data Specimen Banking

Survey and interview data collected from participants will be de-identified prior to sharing with the funder (CDC) via REDCap exported files. No PHI will be shared and demographic data with less than 10 responses per field will be excluded to ensure privacy. No biological samples will be collected nor banked.

8. Sharing of Results with Participants

Aggregate findings from this work will be shared with participants via email in the form of peer-reviewed publications and visual infographics.

9. Study Timelines

Recruitment will commence immediately following IRB approval and end in 18 months.

10. Inclusion and Exclusion Criteria

To be eligible to be in our study individuals must be 18 years or older, be able to communicate in English because labels by the FDA are printed in English on medication bottles, provide written consent, and have consistent access to a functioning phone. Additionally, to be eligible to participate in the focus group with patient participants on long-term opioid therapy individuals will have to have been dispensed an opioid prescription for 60 days in the last 90 days based on self-report and confirmed in their health record. Clinicians working at Grady will who are either nurses who discharge patients with opioids, physicians or advanced practice providers who prescribe opioids, and pharmacists who dispense opioids will be eligible. Additionally, medical

students in training at Emory and rotating through Grady will be eligible to participate. No one will be excluded from participation based on gender, race, or ethnicity. Individuals may opt out of the trainings. Individuals unable to consent and those unable to communicate in English will be excluded.

11. Population

We will work with diverse stakeholders from a wide swath of ethnic, racial, and socioeconomic backgrounds as part of a series of targeted focus groups. Purposive sampling will be utilized in this study. To increase variation in the sample, a brief screener will be conducted with all potential participants to ensure that a racially, ethnically, and economically diverse sample is included in the design and testing of the labels. For example, potential patient participants will be asked to complete the Short Assessment of Health Literacy–English, a validated health literacy assessment tool recommended by Agency for Healthcare Research and Quality's (AHRQ).(Lee et al., 2010) We will conduct a total of 15 focus groups, 5 with each target population: patients who are opioid naïve, patients who are on long-term opioid therapy, and clinician stakeholders who dispense opioids or provide patient education on opioids at discharge (e.g. physicians, pharmacists, nurses, etc.). Recruitment will continue until saturation has been met. Focus groups will be conducted with participants of similar health literacy. Saturation is reached when no new themes emerge within the data content analysis, as well as when repetition and confirmation of previously identified themes occur.(Speziale et al., 2011)

12. Vulnerable Populations

Given the ambulatory patient population and employee focused nature of this work we do not anticipate knowingly recruiting any individual from vulnerable population.

13. Local Number of Participants

90 to 120 individual participants.

14. Recruitment Methods

Potential participants will be referred to the PI by Dr. Schenker from her and her colleague's clinic at Grady (e.g. orthopaedic, emergency medicine, sickle cell). The PI or coordinator will screen individuals for eligibility and engage them in the informed consent process before enrolling them and inviting them to attend a scheduled focus group. Additionally, flyers will be posted in clinic waiting rooms with information on how to be involved in study. Medical students will be sent an invitation email through the student listserv, not individually, inviting them to participate and to sign up for focus group times at a link in the email.

15. Withdrawal of Participants

Individuals may withdrawal from the study at any point by emailing the PI. Data provided participants prior to withdraw will be stored and analyzed unless specifically asked to be destroyed and excluded from the study by the participant upon withdraw.

16. Risk to Participants

Given the qualitative nature of this study, there are minimal risks involved in participating. For example, individuals may become bored during interviews or find the sessions to be too long. The greatest risk associated with the conduct of this study is the potential loss or release of an individual's and/or an institution's confidential information. Therefore, security and confidentiality of the collected data will be maintained throughout the study because all data will be coded prior to being stored on the Emory Servers. All data will be stored and only accessible on a password-protected research drive containing files necessary to answer the research questions proposed in this application. Storage of any electronic data files produced during analysis (R outputs) will occur on password-protected research servers housed on the Emory University network. The network is protected by several firewalls and is monitored by the Office of Technology and Information Services. No data will be placed on local hard drives, desktop or laptop computers. If generated, hard copies of the data will be maintained in a locked filing cabinet in the PI's office. All publications from this study will maintain the confidentiality and anonymity of study participants. No PHI will be stored or coded into the RedCap dataset.

17. Potential Benefits to Participants

There are no immediate benefits to participants. However, findings will inform future system level naloxone dispensing campaigns to reduce opioid overdose risks.

18. Compensation to Participants

Patient participants will receive a $25 prepaid Visa® gift card and clinicians will receive $100. Medical students will receive a $10 Amazon gift card.

19. Data Analysis, Management and Confidentiality

Data collection and transcription will occur simultaneously until saturation is met. NVivo® software will be utilized to identify major themes related to participants' experiences, knowledge, and beliefs regarding opioid warning labels. This allows for an organic inductive approach to explore new or evolving phenomena.(Hsieh & Shannon, 2005) This analysis strategy will allow us to commence coding immediately while data collection is occurring with other participants. To ensure the credibility of the data collected, representative quotations from the transcribed text will be included when identifying emerging themes. In addition, peer debriefing with all authors of the study will ensure consensus on codes applied to the text. This will ensure that emergent patterns and themes can be substantiated from the data collected.(Speziale et al., 2011) To enhance rigor, a traceable audit trail of coding decisions and memos will be available throughout the analysis for other researchers, aside from the individuals collecting the qualitative

data, to review thematic findings.(Sandelowski, 1998; Speziale et al., 2011) The authors recognize that norms and dispensing practices vary across care settings and from facility to facility, but detailed selection, sampling, and inclusion criteria along with a field guide will strengthen the transferability and applicability of this study to other populations dispensed opioid in various settings in an effort to reproduce findings. Participants in all focus groups will complete a brief survey that includes a Likert scale assessing intent to obtain naloxone based on the labels presented. For the focus groups in Aim 3 we will compare differences in mean Likert scores when viewing the original label and the novel ones developed by the graphic designer. Appropriate t-test will be used to compare differences in scores.

Descriptive statistics will be used to examine the sample's characteristics and demographics (e.g., means, frequencies). All hard copies will be stored in locked filing cabinets in the PI's office. Paper survey data will be entered into RedCap. A master list of study ID # and names with emails of participants will be stored on Emory servers and only accessible to the PI and the coordinator.

20. Provisions to Monitor the Data to Ensure the Safety of Participants

No DSMB will be convened given the minimal risks involved in this study.

21. Provisions to Protect the Privacy Interest of Participants

To address the risk for loss of confidentiality associated with conducting research and collecting data, rigorous procedures will be in place to ensure the security and confidentiality of the dataset during analyses. As noted previously, all data will be coded when stored on a secure Emory University server using RedCap. Access to the data will be limited to the study PI, co-investigators, approved research personnel. The PI and collaborators have completed in depth online and in-person training in human subjects training at Emory University. The PI will continue to participate in the Office of Nursing Research's monthly colloquia on conducting ethical research and the responsible conduct of research. These monthly lectures and seminar series are led by research experts across the University and address a wide array of maintaining ethical standards and quality throughout the research process. All data will be reported in the aggregate in peer-reviewed publications to ensure participant privacy. Data shared with funder and other collaborators will be deidentified and no PHI will be collected. Data from the recorders will be downloaded directly to Emory's firewall protected servers and deleted from the digital recording device. The digital MP3 files will remain on the Emory secure server during transcription. Transcriptions of the focus groups will remain on the servers. Any hard copies of the transcriptions will be stored in a locked cabinet in the PI's office at Emory Nursing.

22. Economic Burden to Participants

There are no costs for participants to be in this study.

23. Informed Consent

Consent will be done in person immediately prior to the focus groups and signed by participants. For focus groups conducted through a virtual platform, such as Zoom or Microsoft Teams licensed through Emory, consent will be done through REDCap with the use of electronic signatures prior to the focus groups. The coordinator will provide an overview to the study's purpose, benefits, anticipated risks, and copies of the consent with the surveys and be available to read the consent or answer any questions participants may have. Participants who provide electronic signatures through REDCap will also receive copies of the consent through a secure email. This will include a minimum of 15 minutes prior to trainings. The document as well as the coordinator will emphasize in their verbal instructions that the training is voluntary and they may opt out of the training or surveys at any time point. Due to the FDA's requirement of medication labels being in English, this study will not enroll non-English speakers.

24. HIPAA

HIPPA Authorization will be collected from all participants.

25. Setting

The study will take place across Grady's in-patient units and ambulatory clinics including but not limited to emergency department, intensive care units, medical and surgical units, and radiology. Focus groups will occur in available conference rooms and lecture halls at Grady and Emory nursing as well on Emory licensed Zoom.

26. Resources Available

The Nell Hodgson Woodruff School of Nursing Biobehavioral Research Laboratory. The laboratory includes 400 square feet of dedicated space that serves as a resource for use by School of Nursing and affiliated researchers. This laboratory is equipped for processing and analyzing samples and is outfitted with a Beckman-Coulter refrigerated centrifuge, a 4-degree refrigerator, one -20 and three -80 freezers for long-term storage of clinical samples. Additionally, the lab is equipped with a biotech plate reader, ultra-pure water maker, pipettes, blood drawing supplies, processing tubes and other equipment and supplies needed to advance the range of biobehavioral research conducted in the School of Nursing. The lab is well supplied and staffed by trained scientist who will support the storage, extraction, and analysis of Dr. Giordano's biological samples.

Offices/Computing. All faculty members in the School of Nursing, including Dr. Giordano, have private offices with full computing capabilities networked to printers. Each research faculty has a separate research office space for housing research nurses and activities. Conference rooms and medical media service are provided throughout the relevant buildings. Each office is equipped with desk space, telephone, computer, and file storage space as well as convenient access to photocopying, and conference rooms. Financial and administrative support is readily available and located in offices near the investigators. Through the Emory network faculty can

use the Emory Integrated Computing Core (EICC) for analyses exceeding their desktop machines' capabilities. For more computing power, Emory faculty can now access the cloud computing resources of Amazon Web Services.

Grady Memorial Hospital . Grady Memorial Hospital, part of Grady Health System is a formal affiliate of the Emory Health Sciences Center and staffed by Emory School of Medicine Faculty and Residents. Grady Hospital has a bed capacity of 953 and is among the largest in the Southeast. Grady, an internationally recognized teaching hospital with a historic commitment to serving the health needs of the most vulnerable, is the safety net hospital for the metropolitan Atlanta area, serving a population that is more than 95% African American. Grady Memorial Hospital is staffed by close to 700 Emory medical faculty (full-time equivalent of 270). Together, these Emory physicians provide about 85% of care at Grady in collaboration with Morehouse School of Medicine, which provides 15%. Patients receive extraordinary care, often in Emory-led programs not widely available elsewhere in the region, including poison control and medication assisted treatment. The hospital has a regional perinatal center for high-risk mothers and babies, a neonatal intensive care unit, a diabetes center, a teen center, the Georgia Poison Center, a rape crisis center, a regional burn center, a sickle cell center, a comprehensive treatment program for HIV/AIDS, a level I trauma center, a stroke center, and the Georgia Cancer Center for Excellence. Dr. Giordano and his staff have dedicated office space and computing in the hospital. Trainings will be hosted on units in the conference rooms, auditoriums, or break rooms.

27. Multi-Site Research When Emory is the Lead Site

N/A

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APPENDIX B: RECRUITMENT MATERIALS AND EMAIL TEMPLATES

Hi everyone! My name is Angelina Luciano and I am a second-year MPH student at Emory. I am seeking participants for focus groups regarding my thesis to investigate the perceptions and attitudes medical students have regarding opioid education during medical school. Both preclinical and clinical students are welcome to participate, as well as recent medical school graduates. The focus groups will occur on Thursday and Friday evenings during September, October, and November via Zoom. A **$10 Amazon gift card** will be provided for your time. For those who are interested, the REDCap link is provided below. If you have any questions, please feel free to reach out to me at angelina.luciano@emory.edu. Thank you!
https://redcap.emory.edu/surveys/?s=94X7M4XJRJNC4Y3A

Figure 12. Electronic message distributed to medical students by gatekeepers via GroupMe

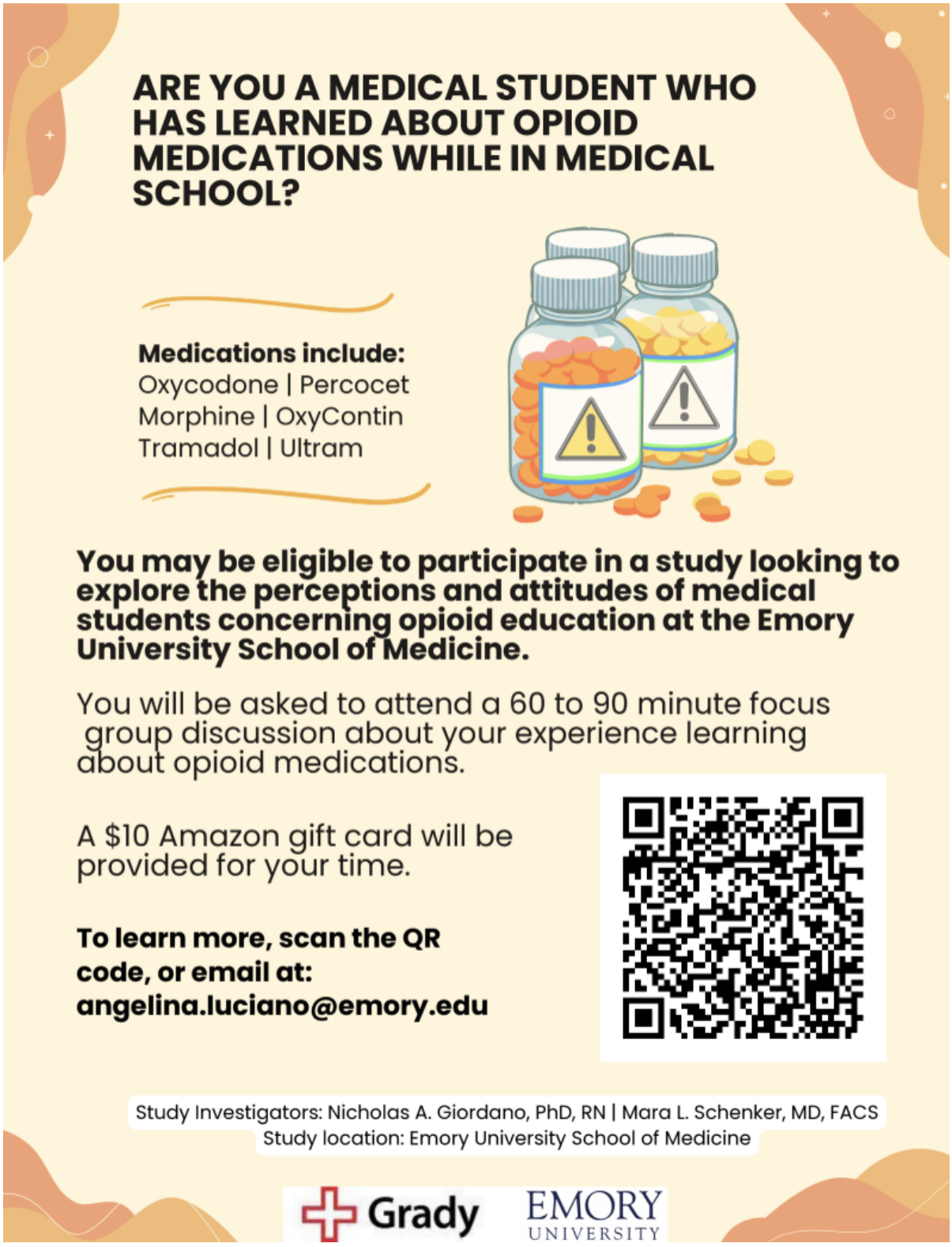

Figure 13. Paper flier placed in the student lounge of one medical school

APPENDIX C: FOCUS GROUP MODERATOR GUIDE

Introduction:

Welcome and thank you for agreeing to participate in this group discussion. My name is Angelina Luciano, I am a second-year MPH student at the Rollins School of Public Health. My role is to guide our conversation today. Before we begin, I ask that you please silence or turn off your cell phones or anything else that makes noise. [pause]

Today we are going to talk about your opinions and experiences with opioid education, specifically opioid education concerning prescription pain relief medications. Please know that your privacy will be taken very seriously; what is shared today will be kept completely private and your identity will not be associated in any way with the research project.

Before we get started, there are just a few things we need to cover.

- Participation in this focus group is completely voluntary. That means you can leave at any time.
- You can choose not to answer questions if you want.
- Also, please speak one at a time.
- The session is being audio taped, so please speak at the same volume that I speak at - if you are talking softly, I may ask you to speak up to ensure your comments are captured.
- I ask that you do not use the names of other people. For instance, if you talk about someone else, just say “my friend” or “this person I know” rather than using this person’s name.
- Participation from everyone is important. There are no right or wrong answers. It is okay to be critical. If you dislike something or disagree with something that is said, I want to hear about it - you won’t hurt my feelings.
- The group does not need to agree on everything - you are more than welcome to voice a different opinion.
- Your comments and information will be kept completely private and your name will not be associated with the focus group or research in any way.
- I will be taking notes on paper during our discussion. No identifiable information will be written down and the notes will not be shared with anyone else.

During the next hour, I am going to ask you all a variety of questions. I am interested in all of your opinions. There are a fair amount of questions I would like to ask, so I may need to move us along occasionally. Please don’t take this personally; it’s just part of the process.

Does anyone have any questions or concerns before beginning?

Before we get started, do I have the permission of everyone to audio record our discussion this evening? [start the recording]

Thank you!

Warm-Up:
So we can get to know each other better, please share your first name and your favorite thing to do to relax. [icebreaker: the moderator will start by restating name and one of their hobbies]
Thank you all for sharing.

Questions:
Let's start by talking about opioids. I understand that opioids may be a sensitive topic for some individuals. If at any point you feel the need to step away from the Zoom call for a moment, I invite you to do so.

1. If you can recall, what were your perceptions and attitudes about opioids before attending medical school?
    a. Reflecting on your prior thoughts, how do you believe those perceptions and attitudes have changed since attending medical school?
2. How would you describe the education you've received regarding opioids during your preclinical semesters?
    a. Are there any experiences that stick out to you? Why?
    b. How was the information you learned beneficial before you began clinical rotations? Was there anything lacking?
3. For those who have begun clinical rotations, could you describe the education you've received regarding opioids during these experiences?
    a. Are there any experiences that stick out to you? Why?
4. In what ways have you felt supported academically and professionally in learning about opioids during your time as a medical student?
5. I am interested in learning about the specialities you all intend to pursue:
    a. Please name the specialty and describe how often you anticipate prescribing opioids.
    b. Regarding the opioid education you have received in medical school, do you feel prepared to encounter opioids when you enter residency? Why or why not?
        i. Could you elaborate?
6. Are there any hesitations, barriers, or gaps in knowledge that you are concerned about as you think about prescribing opioids in your future careers?
        i. Could you elaborate?
7. What other factors do you believe influence prescribing an opioid to a patient?
    a. Can anyone think of any other factors they would like to share? For instance, according to the literature, white patients are more likely to be prescribed an opioid compared to patients who identify as a racial minority.

8. As we conclude our discussion, what else would anyone like to share?

That last question concludes our discussion. Once again I would like to thank you all for taking the time to speak with me this evening. Your responses will be very valuable in my learning about your experiences with opioid education during medical school. To express my gratitude for your participation in this discussion, a $10 Amazon gift card will be sent to the email address you indicated in REDCap. [**So one note about the gift cards, the billing for the gift cards by the research PIs is in the process of being approved. You may not receive your gift card in the next several days but I promise that you *will* receive them as soon as possible.**] Also, if you know of anyone who you believe would be interested in participating in a future focus group, please feel free to provide them with my contact information. If you have any questions about this study, please do not hesitate to reach out to me. This concludes our focus group. [stop the recording]

APPENDIX D: CODEBOOK

Code Category Name	Code Subcategory Name	Definition	Example
Personal	Background	Any aspect of the participant's identity that is specific to their life; it may be related or unrelated to their identity as a medical student.	"I came from [like] a rural community." Quote from Focus Group #2
	Experiences before Medical School	Events that occurred before enrolling and attending their respective medical school.	"I had worked in emergency departments for about three years prior to medical school." Quote from Focus Group #1
Opioids	Perceptions	Discernment of opioids regarding their use in the field of medicine.	"So for me, [umm] so I'm a fourth-year medical student and started in 2018. [umm] And around that time, there was a lot of conversations around [like] opioids, [umm] both [like] prescription and non-prescription use of them. [umm] And so I think I had a very, [like] complicated understanding of opioids." Quote from Focus Group #2
	Attitudes	Feelings toward or about opioids regarding their use in the field of medicine.	"So there's a lot of stigma around the term and there's a lot of shame [umm] projected onto populations who are [like] victims of the opioid crisis. And I would definitely say [like] before med school, I definitely had learned a lot of incorrect [like] bias from that." Quote from Focus Group #2
	Pain Management	Feelings, memories, or lived experiences specific to how opioids are used to treat symptoms of pain.	"So I think that you have to balance the fact that pain management is important and is critical for patients to actually begin to heal. [umm] But also making sure you can figure out ways for the patient to have some sort of [umm] stability

			and post-discharge care and follow-up socially to make sure that it's not something that they are going to become hooked on." Quote from Focus Group #3
	Opioid Epidemic	Feelings, memories, or lived experiences specific to the ongoing opioid epidemic in the United States.	"... you hear a little tidbits from different news, people or news reporters, saying [like] 'oh, there's an opioid epidemic or an opioid crisis.' And a lot of people, I think, the term pill mill is something that's stuck in my mind a lot." Quote from Focus Group #2
Opioid Education	Coursework	Education of opioids that occurred in the classroom setting while enrolled in medical school. This will often be associated with one's preclinical semesters.	"Think that what we learned preclinically was more [like] mechanism of action, things like that instead of [like] the clinical use of it." Quote from Focus Group #2
	Extracurricular	Education of opioids that occurred outside the classroom setting while enrolled in medical school. This could occur during either preclinical or clinical semesters.	"It's outside of the curriculum, and they're working to get it incorporated. But if you [like] take one of their trainings, it's actually really informative [umm] and still extracurricular." Quote from Focus Group #2
	Clinical Rotations	Education of opioids that occurred during a clinical encounter while enrolled in medical school. This will often be associated with one's clinical semesters.	"So [umm] being [like] in the wards, like in internal medicine, I had to learn a lot more things." Quote from Focus Group #2
	Advantages	Perceived strengths of experiences regarding what or how opioids were taught during medical school.	"And then we did actually have two lectures from the Director of New Jersey Poison Control [umm] who kind of gave us a talk on [umm] overdosing, naloxone, as well as kind of the misconceptions of overdosing that do exist, especially regarding fentanyl."

			Quote from Focus Group #3
	Disadvantages	Perceived weaknesses of experiences regarding what or how opioids were taught during medical school.	“For me, I think with emergency medicine often we’ll see overdoses and I’ve been an EMT for a few years now and I think that that’s probably helped me more than medical school. Just because medical schools have a harder time putting students directly in those situations.” Quote from Focus Group #3
Support	Faculty	The perceived quality of helpfulness or experiences surrounding instances of receiving aid from faculty members during medical school.	“I mean I think [umm] for me, the preclinical side, the different instructors who did talk about it, were very passionate about it and very knowledgeable about it… But they did talk about different resources, different ways of addressing patients to discuss pain medication and pain management.” Quote from Focus Group #3
	Medical Providers	The perceived quality of helpfulness or experiences surrounding instances of receiving aid from medical providers, or any type of clinical educator, during medical school.	“... I learned it from [like] interns and residents about [like] actually applying [like] these drugs to different patients.” Quote from Focus Group #2
	Peers	The perceived quality of helpfulness or experiences surrounding instances of receiving aid from fellow medical school students during medical school.	“I think they're called like the addiction medicine recovery group or something along those lines, and they've actually [like] spearheaded a lot of naloxone trainings.” Quote from Focus Group #2
Prescribing Factors	Opioid Seeking Behaviors	A factor that affects patient receipt of an opioid prescription as the result of medical providers perceiving that the patient is malingering	“I'm afraid that, “oh, there's a slight chance that maybe they're malingering and they're not actually in this pain,” [like] letting instances like that affect the care of my patients.”

		pain symptoms in an attempt to receive and misuse opioids.	Quote from Focus Group #2
	Clinical Setting	A factor that affects patient receipt of an opioid prescription as the result of the perceived intensity of medical providers' clinical environment at the time of treating the patient.	"As awful as it sounds, I do think that some of it just comes down to burnout, being tired, long shifts, [umm] being pulled in every direction to see different things and do different things that it's a lot easier to prescribe something that you know you've prescribed to other people, numerous times and so you assume it's going to work for this one." Quote from Focus Group #1
	Medical Provider Work Shift	A factor that affects patient receipt of an opioid prescription as the result of the order in which medical providers meet with their patients during a work shift.	"And also, some of it is unfortunately you kind of are affected by the patient you just saw before you go see the next one, so if you're spending all this time with someone who is drug seeking and insistent on getting all of the [umm] strongest drugs, although they don't need it, you might be worn out and then you go to the next patient who is actually in pain and you're kind of just dulled by the previous conversation and you're not really treating their pain as much because of that." Quote from Focus Group #1
	Medical Provider Identity	A factor that affects patient receipt of an opioid prescription as the result of aspects of medical providers' identity, including their knowledge and lived experiences.	So I work in an ER not affiliated with my school, and it has residents there. [umm] And one of the residents had a patient with severe pain, crying, whatever, [like] severe, severe pain. And the attending asked the resident, "what would you want if you had this pain?" And she said, "I'd want Dilaudid." And the attending then said, "so what are you going to give her?" and she said, "Tylenol."

			Quote from Focus Group #3
	Patient Identity	A factor that affects patient receipt of an opioid prescription as the result of aspects of the patients' identity known by their medical providers, including their appearance and medical history.	"And you don't have the conversation and it turns out that person may have never had a narcotic before but they have extensive family history of addiction to opiates and [like] perhaps having the conversation beforehand or even avoiding opiates would have been a better idea." Quote from Focus Group #1
	Medical Provider Biases	A factor that affects patient receipt of an opioid prescription as the result of biases harbored by the medical provider when interacting with patients.	"Even if you change the way you approach opioids, there are people who have other biases and beliefs that still are going to inform who they feel like is in pain, who they feel like is more likely to become addicted or less likely to become addicted." Quote from Focus Group #2
	Structural Racism in Medicine	A factor that affects patient receipt of an opioid prescription as the result of the extent to which structural racism exists in a clinical setting, including the medical provider-patient interaction.	"I'm trying to think of the best way of saying this, but I think to the point of just [like] greater [like] structural racism, you know, that occurs within the medical field and the ways that that can consciously and unconsciously affect people's behavior. [umm] So I think [like] that's definitely an influence…" Quote from Focus Group #2
	Fear of Opioid-Related Adverse Events	A factor that affects patient receipt of an opioid prescription as the result of medical providers being worried for or afraid of adverse events, medical or not, that may arise when prescribing opioids to a patient, in which the decision to prescribe may	"And [umm] you definitely see that [like] cynicism from doctors and [umm], you know, kind of a hesitancy to prescribe for certain people [umm] just for fear of either, you know, some kind of legal action or some kind of just, you know, not wanting to put up with somebody that's, you know, repeatedly coming in with pain…" Quote from Focus Group #1

		or may not be the most well-informed decision.	
Future	Specialty	The medical speciality that participants are interested in pursuing upon graduating from medical school.	“I'm trying to go into orthopedic surgery, I'm applying right now.” Quote from Focus Group #1
	Exposure to Opioids	The anticipated frequency of interacting with opioids or prescribing opioids that participants believe they will encounter once practicing medicine in their specialty of interest upon graduating from medical school.	“I assume that it will be an everyday, weekly if not everyday, thing just from being in a surgery field. I feel like it's just something that comes with the territory.” Quote from Focus Group #1
	Expected Patient Interactions	The anticipated types of interactions with patients that participants expect to have in clinical settings upon graduating from medical school.	“I guess, you know, depending on where you end up in this field, you know, opioids could be a consideration but I think, in general, gonna probably interact with it a lot less than I would if I were treating an adult population.” Quote from Focus Group #1
	Hesitations, Barriers, and Gaps in Knowledge	The anticipated issues or concerns that participants feel they may experience or encounter concerning opioid use or prescription during clinical practice upon graduating from medical school.	“I think a hesitation for me is always [like] how the patient will [like] receive the conversation. Because [like] a lot of times people you're prescribing opioids to don't necessarily [like] have an issue with misuse.” Quote from Focus Group #1
	Hopes	Any positive feelings or wishes the participants have when considering future beneficial changes concerning the state of the opioid epidemic in the United States.	“So I think that, as horrible as this entire epidemic is, I’m hoping that it’ll prevent a future one, that we’re just more skeptical of incoming medications and kind of really digging into what the research is saying rather than what the salespeople are saying.” Quote from Focus Group #3

APPENDIX E: IRB EXEMPTION FORM

IRB EXEMPT REVIEW

April 27, 2022

Nicholas Giordano, PhD RN

Ngiorda@emory.edu

Title:	Improving Opioid Dispensing Practices to Mitigate Risks and Address Disparities
Principal Investigator:	Nicholas Giordano
IRB ID:	STUDY00004163
Funding:	Name: CDC, Funding Source ID: will add when received
Documents Reviewed:	• Checklist, Category: IRB Protocol; • Consent, Category: Consent Form; • Consent Checklist, Category: Other; • Flyer, Category: Recruitment Materials; • Grant, Category: Sponsor Attachment; • Interview Guide, Category: Surveys, Questionnaires, Interview Guides; • Protocol, Category: IRB Protocol; • Questionnaire , Category: Surveys, Questionnaires, Interview Guides; • SAHL-E and screener, Category: Surveys, Questionnaires, Interview Guides; • Waiver Checklist, Category: Other;

Dear Dr. Nicholas Giordano:
Thank you for submitting an application to the Emory IRB for the above-referenced project. Based on the information you have provided, we have determined on 4/26/2022 that although it is human subjects research, it is exempt from further IRB review and approval. This project meets the criteria for exemption under 45 CFR 46.104(D)(2). Specifically, you will use a qualitative research design that utilizes data collected during focus groups to examine current experiences with opioid dispensing and labels to inform the design of novel labels. The research will be exploratory, aiming to identify key concepts for developing and refining opioid warning labels and potentially redesigning dispensing containers.

Please note the following in association with this exemption:

- Attached are stamped approved consent documents. Use copies of these documents to

document consent.

- The IRB verified that the grant application referenced above corresponds to this research protocol.

- A partial waiver of HIPAA authorization has been approved by the IRB for the purpose of identifying potential subjects for this protocol. As subjects are contacted, you are required to obtain their HIPAA authorization.

This determination is good indefinitely unless substantive revisions to the study design (e.g., population or type of data to be obtained) occur which alter our analysis. Please consult the Emory IRB for clarification in case of such a change. Exempt projects do not require continuing renewal applications.

Please note that the Belmont Report principles apply to this research: respect for persons, beneficence, and justice. You should use the informed consent materials reviewed by the IRB, if applicable. Similarly, if HIPAA applies to this project, you should use the HIPAA patient authorization and revocation materials reviewed by the IRB unless a waiver was granted. CITI certification is required of all personnel conducting this research.

Unanticipated problems involving risk to subjects or others or violations of the HIPAA Privacy Rule must be reported promptly to the Emory IRB and the sponsoring agency (if any).

Sincerely,

Patricia Leslie
Research Protocol Analyst

APPENDIX F: FOCUS GROUP #1 TRANSCRIPT

Date: September 29, 2022
Time: 6:00pm
Duration: 52 minutes, 39 seconds
Location: Zoom
Moderator: Angelina Luciano

Key
[*italics*] italicized words contained within brackets are nonverbal actions or behaviors [**bold**] bolded words signify that information was removed from the transcript as a means of protecting the identities of the participants [not italics/bold] non-italicized words contained within brackets are verbal words that are not designated as speaking; words or sounds used to fill space but don't remark on spoken phrases [*not italics/bold*] non-italicized words surrounded by asterisks contained within brackets are important notes regarding preceding words or phrases
Examples: [**name redacted**] [**SOM name redacted**] [*undistinguishable audio*] [umm] [hmm] [like] [*pause*] [*laughter*] [*nodding*] [*stuttered in speech, repeated dialogue*]

Moderator:
So we can get to know each other a bit better, please share your first name and your favorite thing to do to relax. I'll start, so my name is Angelina and my favorite thing to do to relax is to read.

Participant 1:
I can go next. My name is [**name redacted**]. My favorite thing to do to relax [*pause*] probably watch football.

Participant 2:
My name is [**name redacted**], my favorite thing to do to relax is to write.

Participant 3:
My name is [**name redacted**]. [Umm] my favorite thing to do to relax is play with my cats.

Participant 4:
Hi my name is [**name redacted**]. My favorite thing to do to relax is to run.
Moderator:
It's all really great, thank you all for sharing. So let's get started by talking about opioids. I understand that opioids may be a sensitive topic for some individuals. So if at any point you feel the need to step away from the Zoom call, please feel free to do so. If you can recall what were your perceptions and attitudes about opioids before attending medical school?

Participant 3:
I mean, I personally I got my MPH before medical school and [like] spent time [like] working with and taking classes about addiction during my MPH so I personally [like] didn't come to med school with [like] at least [like] active, you know, [like] negative connotations towards [like] opioids or [like] addiction in general just because I had spent a decent amount of time, [like] working on what that actually is prior to medical school.

Participant 2:
I had worked in emergency departments for about three years prior to medical school. And so we had a lot of drug seeking behaviors that would show up, but we also had patients who very much needed the pain medications and you could visibly see how it would benefit them. [umm] So I kind of saw that there could be problems with opioids but also a lot of benefits. And I also took a [umm] class in my undergrad on kind of the opioid pandemic and stuff like that. So I think that kind of also set me up for learning more about it in med school.

Participant 1:
Yeah, I also [*stuttered in speech, repeated dialogue*] similar kind of role where I was working at an orthopedic surgery practice prior to med school and I just recall [like] it was right around the time when they were starting to implement the PDM [*stuttered in speech, repeated dialogue*] like the PDMP [*prescription drug monitoring program*] program. And [like] really tracking people's prescriptions. And so [like] I had [like] this association with [like], just making [*stuttered in speech, repeated dialogue*] by being a very serious drug and but doctors are very [like], you know, being strictly watched as far as their prescription [like] practices and so, definitely came with a lot of [like], you know, watching drug seeking behavior and things like that. So, definitely had negative connotations with that, but also is [like] a drug that was really necessary for post-op [*post-operation*] patients and things like that.

Participant 4:
Yeah I think before school my relationship was not from [like] a medical standpoint, it was more

just kind of observing [like] how it was portrayed in the media and knowing some people who struggle with opioid dependence [umm] but not from a kind of medical lens.

Moderator:
Yeah, that's all really great insight. I'm interested to know, so reflecting on your prior thoughts that you've shared. [umm] How do you believe those perceptions and attitudes have changed since you've attended medical school?

Participant 2:
I think I became a bit more irritated by the lack of educating patients about their medications. [umm] We'd see in the ER, like I said, [like] some drug seeking behaviors, and some we knew were drug seeking due to them having a known history of it, coming in asking for Dilaudid directly and could check the PDMP [prescription drug monitoring program]. But at the same time, it kind of made you wonder, where did it start and why? And then having seen some patients who have a history of sickle cell disease, not trait, and being in pain, and then having people kind of question whether they should actually get pain medications or not, because there's a debate of whether they were actually just drug seeking. [umm] It kind of, I think, made me wonder why some of the doctors were already kind of [*stuttered in speech, repeated dialogue*] they're kind of irritated by the situation and they're almost taking it out on the patients instead of just giving them the benefit of the doubt. And I realize there's a responsibility to not just prescribe the pain medications blindly. But sometimes withholding it seems kind of cruel. And then seeing patients who didn't realize what different pain medications do and how they work and so kind of misusing it for that reason, [umm] would also lead to them coming back to the emergency department. So I think kind of the main example I would have for that is if a patient was prescribed an opioid as well as something like gabapentin, they could have nerve pain and they don't realize that gabapentin will help with that. So they just keep taking their opioid and that's not really cutting it and so they just keep taking and they're not taking the gabapentin and eventually, either overdose, get addicted to opioids, are overusing it and so forth instead of just having been told [like] this one medication is going to be more for the nerve pain, if you take it you probably will need less opioids and that will help reduce the chances of addiction. [umm] So things like that where I think if we spent more time with the patients there'd be less problems long term.

Participant 4:
Yeah I also think that [umm] I noticed a lot of biases that providers carry. I know I carry my own biases and I think that kind of circles back to [like] what education we're receiving in medical school on the topic and [like] continued education on how to manage pain appropriately. Whether that is opioid abuse or other medications or, you know, kind of strategies to approaching that but [umm] I personally feel like I don't really have a good footing right now on [like] how I

would approach experiencing a lot of pain [*undistinguishable audio*] I don't think that's something that's been emphasized in our preclinicals [umm] and I'm currently on rotations now and I don't feel like I gained a better understanding kind of [like] working on the wards at least.
Participant 3:
For me, at least, [like] when I did a lot of the work during my MPH [*stuttered in speech, repeated dialogue*] I feel like the MPH is in general just a lot more holistic and you [*nods toward moderator*] probably [like] know that like in [like] how you approach a lot of [like] problems. So [like] I learned about it from [like] a very [like] human perspective, [like] who is the person behind [like] this disorder? And I feel like a lot of times in medicine, and also the way we're taught, [like] we're not really taught about [like] the person behind it. And like [**redacted name of Participant 4**] said, [like] how to have those conversations, [like] I know to have this conversation because of my previous work, but [like] not because of anything that's been done while I'm at [**SOM name redacted**]. [umm] And, I don't know, I feel like that often gets [like] forgotten that [like] there's [like] a person behind all of this and [like] that should really be [like] at the forefront of the conversation in my opinion.

Participant 1:
Yeah, I definitely agree. You [like] learn [*stuttered in speech, repeated dialogue*] you know, in med school you learn all the pharmacology, you start learning how all these drugs work and everything. And you focus on kind of all the, you know, the technical aspects of it and then you get into rotations. And [umm] you definitely see that [like] cynicism from doctors and [umm], you know, kind of a hesitancy to prescribe for certain people [umm] just for fear of either, you know, some kind of legal action or some kind of just, you know, not wanting to put up with somebody that's, you know, repeatedly coming in with pain and then I think [umm] like all of them said, you know, there's definitely [like] a human element to it and [like] some kind of, [*stuttered in speech, repeated dialogue*] I feel like not a greatly addressed way of [like] really managing [like] these patients that have long-term pain and chronic pain and things like that. [umm] I that's something that definitely could be addressed a little bit more, especially in medical school.

Participant 3:
That note, I thought, [umm] one of the weird aspects of my medical education reforms, pharmacology and pain meds, the attempt to address the opioid pandemic and over-prescribing has almost kind of prevented us from keeping in mind that there is a patient and actual person. And kind of one of the more recent examples I had of that was on an exam they asked, there was a patient who had metastatic cancer, and they had [like] 9 or 10 out of 10 pain, and they weren't taking any pain medications. And so the question was [like], what should you first give them? And per the WHO ladder, like pain scale, you should start with [like] an NSAID [*non-steroidal anti-inflammatory drug*]. It's [like] that's not really going to touch their pain, but there's an attempt to try to prevent us from just jumping straight to opioids that kind of ignores what the

patient necessarily needs and, at the end of the day, they have metastatic cancer and they're in excruciating pain, I'm not that concerned about their long-term addiction to opiates. [umm] But so I think that there is an attempt being made to bridge the gap, but instead it's also kind of preventing us from remembering that there was actually a patient at the end of the day and they're a person there.

Moderator:
Yeah, that all sounds really great. Thank you all for sharing that. So this was kind of touched on [*stuttered in speech, repeated dialogue*], I know, [**redacted name of Participant 4**] had said something about [umm] better addressing [like], how to approach pain management, [umm] specifically in preclinical semesters. So I wanted to ask how would you describe the education you've received regarding opioids during your preclinical semesters, specifically, while you were in medical school?

Participant 3:
I'm currently an M2 [*second-year medical student*] so I feel like I might be the most recent person. I'm still in preclinicals [*laughter*] and there's [like] nothing. [umm] We haven't had our psych [*psychiatry*] course yet and [like] I was looking ahead of schedule and [like], they do talk about [like] disorders, but [like] it's [like] the DSM V criteria [like], again, [like] it's not that [like] human element of it or [like] how to have those conversations with patients. But [like] the most relevant things we do, were [like] we have one conversation on [like] judicial prescribing that [like] wasn't even that [*laughter*] comprehensive. [Like], really not at all. And we have one conversation about motivational interviewing that only talks about smoking and diet change, [umm] which is just not [*stuttered in speech, repeated dialogue*] and [like] it's just a very outdated training in general and actually [like], I'm head of the addiction medicine harm reduction interest group, and [like] we're currently working with the essentials of patient care's directors to [like] make those better and [like] more comprehensive because they're just [*stuttered in speech, repeated dialogue*] they just don't [like] cover much. So at least from my perspective [like] there's really [like] not a lot to address it, [like] at all.

Participant 2:
Mine was actually fairly different. [umm] In our first year, we actually had several seminars, where we were [*stuttered in speech, repeated dialogue*] we joined the pharmacology track [*stuttered in speech, repeated dialogue*], so like the pharmacy track [umm] students, just for lectures and [umm] workshops on basically opioids to be quite honest. And [umm] we had [umm] several current addicts as well as former addicts who came to talk about their experience. We had several lectures on how to prescribe, when to prescribe, and we worked with the pharmacists also and they corrected all of our messed-up. prescriptions. [umm] And we went through also the pros and cons of the various options and when to choose which one, including [like], it's easy to say, you know, give them buprenorphine versus something else. But like, if it's

someone who constantly relapses, you need to pick which alternative you're going to pick. Because [like] methadone, every time you start it is high risk versus buprenorphine. [umm] So [like] we went through it quite in-depth. I thought the main negative is that it was really just first-year, so you then had another preclinical year before you got to your clinical experience. I happen to be pretty fortunate, one of my rotations, my family med rotation, every Tuesday was actually a methadone clinic. So [like], I kind of got an extra dose of that there. No pun intended, but [umm], the rest of the students, I don't think they had placements with [like] methadone clinics or anything else. So I agree, [like] outside of that. It was pretty much the psychiatry rotation that kind of just went over addiction in general and I also agree that the motivational speeches and interventions are very focused on diet and smoking and alcohol, and less so about drug use.

Participant 4:
Yeah, I agree with what [**redacted name of Participant 3**] said about [like] [**SOM name redacted**]'s [umm] preclinical. I really don't feel like I got [like] any education on opioids. I think there are [like] places you could work it in, like when you're learning [like] pharmacology [like], you know, and you're learning about these drugs [like] connecting to [like] the real world of [like] prescribing habits and issues [umm] you could face [umm] with those drugs and kind of the challenges. But yeah, I think my [like] most kind of [like] real life experience was [umm] on my psychiatry rotation. So if there is a question that [like] better addresses [like] clinical experiences, I feel like we can talk about that.

Moderator:
So [umm] kind of going off of that and moving into the next section. So I'm interested in knowing [like] how, for those who this applies to, how the information you learned in your preclinical semesters [umm] was either maybe beneficial or lacking [umm] regarding your knowledge of opioids before you entered like clinical rotations and your clinical semesters.

Participant 1:
Yeah, you're asking [like] how our preclinical courses [like] on opioid training or education on opioids helped us in clinical years?

Moderator:
Yes, if it did, or if you found that there were certain areas [umm] where you were lacking in knowledge, potentially, going into your clinical rotations.

Participant 1:
Yeah, I mean, I think they do a pretty [like] extensive job of [like], you know, really teaching you the, you know, the pharmacology of bodily opioids and either by that or you're [like] required to know it for examinations and [umm] shelves and stuff like that. But [umm] I think as far as [like]

getting to actual clinical practice, [umm] you start [*stuttered in speech, repeated dialogue*] you kind of, I don't know, for me, I was [like] definitely [*stuttered in speech, repeated dialogue*] you [like] learned the mechanism is everything but you don't really quite understand [like] how opioids are [like] supposed to be used and how they're [like], I guess on the other side of it, [like] how they're [umm] the drugs to kind of treat opioid addiction on the other side of it as well or kind of, not really, at least for me, [umm] wasn't very clear and [like] how it was dosed and all that kind of thing. So that's just one thing I remember from [like] going from [like] learning it preclinically to [like] actually [like] seeing people prescribe it was kind of a big jump

Participant 4:
Yeah, I agree. I feel like, from a clinical aspect, [like] I [*stuttered in speech, repeated dialogue*] yeah I wasn't really prepared to kind of [like] address patients who [umm] are in need of opioids or trying to kind of [like] clinically decide [like] when it's appropriate to prescribe versus when it's not. I feel like that part [umm] was lacking. [umm] And I think too just kind of [like] differentiating between [like] different kinds and [umm] I think just a lot of that education [like] kind of, like [**redacted name of Participant 1**] said, [like] you learn the mechanisms, you know, you have [like], I think [like], your classic textbook questions, but in real life, I think the situations are much different when you come across them in clinic. And [umm] yeah, I just feel like [umm] I haven't received too much kind of prep for that.

Participant 2:
I feel that my program prepared us quite well. But then when we got to the clinical aspect, we occasionally, you know, might be asked like, what pain medication do you want to [*stuttered in speech, repeated dialogue*] would you administer or prescribe? But because we weren't doing it, I still feel as if there's a big question mark that goes on my head of [like] how much? Because I might know [like] yes, this patient should get a narcotic versus this one shouldn't and can use different [umm] options instead. But there's still that question of like, okay, so if I agree and the doctor is in agreement that we should give them [umm] oxycodone or whatever. I still don't feel like I know how much is reasonable, if that makes sense. That is considered safe, but also reasonable and also ensures that the patient is comfortable and not putting them at risk. And then there's always the question of [like], do you also prescribe Narcan and everything else and where kind of that line lies of [like] how to apply what we learned in clinic. I think that's [*stuttered in speech, repeated dialogue*] that's unclear.

Moderator:
Would anyone like to share [like] an experience or an example of how like, you know that [*stuttered in speech, repeated dialogue*] that you witnessed this or you experienced something to this degree? I'd be interested in hearing.

Participant 2:

I'm not entirely sure I understand the question. [like] Are we sharing a story of being uncertain of what to do or a story about someone who is struggling with pain control?

Moderator:
I guess any experience in general, I was wondering how [*stuttered in speech, repeated dialogue*] I guess I could have definitely phrase this better. [umm] If anybody has an experience they would like to share [umm] regarding being trained on opioids in a clinical setting or [umm] maybe being unsure of something or learning, any kind of experience. This could even be in your preclinical semesters as well. [umm] An experience that you've had, like you said, when you were discussing maybe with [like] doctors regarding [like] dosage or what 's appropriate, what's not appropriate. Any experiences that come to anybody's mind I'd be interested in hearing.

Participant 2:
I think for me the most interesting was actually less about the doses and so forth, but in the methadone clinic, we had one patient who every week would end up failing the [*stuttered in speech, repeated dialogue*] the urine test, the urine screen. And they'd swear that you know, they never took anything else other than the methadone that was given to them. But they would be positive for just about anything else, whether it was methamphetamines, cocaine, it could be anything. It wasn't always the same thing either. And so there was always this question of [like], how do you deal with that patient because they need their methadone to function, really, and if you don't give it to them, then you don't really know what they're going to do. But at the same time, you don't really want to be encouraging them to just use the methadone or sell the methadone while they're taking cocaine instead, or whatever they're doing with it. [umm] So there was very much a fine line and you could tell that on some days, the doctor was kind of just overwhelmed and [like] not [*stuttered in speech, repeated dialogue*] didn't have time or just didn't have the energy or the bandwidth really to sit down and have like a thirty-minute conversation with the patient. But also there's [*stuttered in speech, repeated dialogue*] there's some patients where, you know, they might fail it once in a blue moon, but it felt almost belittling and you could tell that the patient didn't take it well, if [like], the 30-year-old doctor is kind of telling the 60-year-old who's addicted to opioids due to having been a veteran and having chronic back pain from having been in war or anything, you know, telling them [like] you really shouldn't be taking anything else [like] it just didn't feel necessarily comfortable or appropriate. So I think the main thing was trying to find that way of approaching the conversation, but also reading the patient so that you weren't pushing them away either. And I think that goes back to what, I think it was [**redacted name of Participant 3**], who's saying that [like] we learn about motivational [umm] speaking and also how to do different interventions. But at the end of the day, we've trained so much on [like] diet and smoking and alcohol and less on the opioid stuff, that it still felt really difficult to try to have those conversations.
Participant 3:
I will say I'm just a preclinical student, and so [like] my experiences in [like] the clinical sense

aren't [like] as robust. [umm] But [like] one thing I know is that [like] you should prescribe Naloxone when you have [like] over a certain dose or [like] you have [like] benzodiazepines as well. And there have been [like] a number of times either, like an OPEX [*outpatient experience*] or [like] in wards or shadowing where [like] the doctors just [like] won't do it, [like] co-prescribe Naloxone. Or when [like] I asked if they've ever done it, they just kind of [like] dismiss the question. Or [like] even sometimes I've seen [like] it pop up, like oh, you should also [like] add this prescription and they [like] almost [like] reflexively, [like] click through it [like] they almost know it's gonna pop up and [like] no matter where to put their cursor already to [like], just get rid of [like] the window message. So [like], it's either they don't know they should do it, they don't want to deal with it, they don't [like] see the importance of it. And that goes back into [like] us not knowing how to have conversation with patients about [like] the potentially [like] deadly and addictive medication that they're being prescribed even though they might [like] need it. And also [like] current attendings not knowing or [like] just not wanting to have that conversation either. So [like], and then that trickles down to us, because then they're the ones [*stuttered in speech, repeated dialogue*], so we can't learn from someone that doesn't know how to do it or do it themselves.

Participant 1:
I think that frustration is [like] [*stuttered in speech, repeated dialogue*] from [like] prescribers, you definitely get [like] a feeling that [*stuttered in speech, repeated dialogue*] [like] that a lot of the patients [like] you know, there's just a lot of steps for them to have to go through, [like] they have to check the PDMP [*prescription drug monitoring program*], they have to [like] do all these things to [like] verify that they remember to prescribe it. And so, [like] you could get a second-hand sense of [like] the burden that [like] prescribing opioids puts on, [umms] you know, doctors and nurse practitioners and everybody that prescribes them. And so [like] I don't know, it's kind of hard to [like] say how it would affect me now [like] in the future, but [like] you definitely remember that [like] feeling that you see doctors have when trying to prescribe opioids.

Participant 4:
Yeah [umm], and I'm actually, next week, doing my week of palliative care. So I'm pretty interested to see kind of [umm] the perspective that those physicians have. And I'm wondering if it's going to be slightly less, you know, jaded or irritated with the system [umm], because I think those people are dealing with people who aren't, you know, [*stuttered in speech, repeated dialogue*] you know, the patients have chronic pain and just, I mean, it's [*stuttered in speech, repeated dialogue*] I think a big part of kind of the conversations they have, so I feel like I'm expecting them to be a little more kind of [like] mindful and holistic to their approach. [umm] But I'm kind of curious to see how [umm] that will be next week.

Moderator:

Yeah, thank you all for sharing that. I really appreciate it. So another question I want to ask is, in what ways have you felt academically or even professionally supported while you've gone through medical school, clinical experiences [umm] when learning about opioids or being trained about opioids?

Participant 4:
I feel like it's [*stuttered in speech, repeated dialogue*] that's an interesting question, because I don't think we're really, at least [like] we haven't gotten a lot of exposure preclinically at [**SOM name redacted**] and so I think the opportunities to kind of [like] feel supported about [like] learning about those challenges aren't really there because [umm] the emphasis on that teaching isn't there as much in the curriculum. [umm] So yeah, I think that's kind of [*stuttered in speech, repeated dialogue*] for me a little more challenging to kind of evaluate on because I feel like it doesn't kind of come up. For other challenging topics, I know that they kind of [*stuttered in speech, repeated dialogue*] they always get what feels like a blanket, you know, here are the resources available to you. I feel like it's usually kind of pretty generic when that's sent out from the school.

Participant 3:
I will say during my preclinical times, [like] I think it was like during co-op [*cooperative education*] too [like] there was literally a professor who played a video of an overdose without [like] any trigger warnings, any [like] warnings before class and [like] there were people sitting in the room who had friends and family [like] that had died from overdoses. Students [like] reached out to me because of [like], just being president of the addiction medicine interest group. And when we reached out to the course director to be [like], this isn't okay. But it's great that [like] they're showing what this looks like, but you need to either [like] have a warning so we can step out of the room or just [like] let people know they can watch it beforehand if they want to or [like] something like that. [like] She was very [like] supportive of that change. [umm] But it was also just [like] a little surprising that someone thought that that was okay [like] to begin with. And then just in my work to [like] help change the curriculum, we've been met with a ton of resistance. So [like] I know it's not necessarily [like] the learning of it, but [like] in the changing of the ways that we learn about it [like] I have not personally and [like] none of my colleagues that I've been working with me have felt very supportive. There have been [like] a few faculty members that are [like] really into it, and [like] really [like] gung ho about it, which has been great, but it's definitely not the majority. [like] We've dealt with some very [like] [*stuttered in speech, repeated dialogue*] very nasty deans at the med school with very serious biases. So in my experience, I feel less than supported other than by [like] three people.
Moderator:
I'm sorry to hear about that.

Participant 1:

I don't know but I have much to add. [umm] I think through it in terms of just [like] supporting us from [like] an opioid education stance. I mean, I think [like] there's so much going on in medical school for them to [like], you know, from wellness to [like] just supporting your education [like] holding your application to [like] getting you into residency. So [like] I think there's some things that just [like] fall by the wayside sometimes, especially as you get further on, so I can't say that I recall anything [like] specifically that they [like] support as far as [like] opioid things go in the clinical years, but I mean, yeah, that's definitely something that [like] probably can be addressed.

Participant 2:
So I did not go to [**SOM name redacted**]. But I do think that one of the things that was different with the program was kind of [like] that whole [*stuttered in speech, repeated dialogue*] those seminars that we had with the pharmacology students and [umm] having time to actually speak with addicts, whether they're current or former, and they had one who had relapsed a ton of times. [umm] But unlike other cases, we did have a trigger warning for that. But I still felt as if a huge part of it was kind of trying to have that wow factor where [like] it kind of hits you in the face and you think about opioids for that week, and maybe next week but then it's never brought up again, really. And I think that's kind of where the problem at least in my program was, is that they do a decent job of making sure that they covered the material, but it's not brought up ever again. So, I mean, yes, you might get a question here and there [umm] about it on exams as well in the hospitals, but at the end of the day, you don't, you're not kind of aware of the difficulties with opioids or how to manage them beyond [like] the one week intensive that we do on that.

Moderator:
That's all really great feedback. I appreciate you all sharing that. Also, I'm interested in learning more about the specialties you all intend to pursue. [umm] So if you feel comfortable, [umm] please name the specialty and how often you anticipate prescribing opioids in your future practice.

Participant 1:
I'm trying to go into orthopedic surgery, I'm applying right now. [umm] I assume that it will be an everyday, weekly if not everyday, thing just from being in a surgery field. I feel like it's just something that comes with the territory.

Participant 2:
I'm also [umm] pursuing orthopedics and similarly I am aware that ortho [*orthopedics*] is the leading, if not one of the top three, specialties for prescribing narcotics, so I anticipate that will also be a daily thing for me.

Participant 4:
I'm thinking right now [umm] I'll be going into pediatrics. [umm] So I think [umm] I guess, you know, depending on where you end up in this field, you know, opioids could be a consideration but I think, in general, gonna probably interact with it a lot less than I would if I were treating an adult population. [umm] I think also there's, you know, an opportunity in pediatrics to try and [like] educate [like] teens and adolescents on, you know, opioids and the epidemic and kind of [like] healthy ways to think about that. So yeah, I'm not really sure right now what that will look like.

Participant 3:
[umm] I have no idea but if I had to apply tomorrow, I would probably do [like] general surgery and go from there. [umm] I would probably imagine that in the circle, a surgical specialty would be a more frequent occurrence, though I have no idea. Just because I don't really know what I want to do. Sorry. I'm so sorry [*laughter*].

Moderator:
[*laughter*] No, don't apologize. That was a really great answer. [umm] So regarding the opioid education you received [umm] thus far or [umm] you received overall in medical school, [umm] how prepared do you feel to encounter opioids when you enter a residency [umm] or practice in general?

Participant 1:
I think I feel somewhat prepared, but I think with [*stuttered in speech, repeated dialogue*] as well as it is with a lot of things, it's like when you get to residency, you're kind of [like] learning a lot of things on the fly and how things go based on whatever hospital or organization you end up. So it's like one of those things where you just kind of have to use the information you have and, you know, rely upon others to kind of help you figure it out when you get to actually being a resident.

Participant 4:
Yeah, I agree. I think it'll be a learning curve. I think it's different hearing about it without actually having to do it, like a lot of other things during residency, I think pretty similar to [**redacted name of Participant 1**]'s answer.

Participant 3:
I think I would tend to agree. I think I feel more comfortable than [like] the average person talking about it just because of [like] my background, but that also being said [like] in that kind of setting, I could see how [like] I would feel just unprepared and [like] in general, and just [like] [*stuttered in speech, repeated dialogue*] just a lot of uncertainty with [like] obviously every patient is different. [umm] So I feel [like] maybe feel [like] a little bit above average with regards

to [like] my comfort level but [like] still I feel like you're never one hundred percent comfortable.

Participant 2:
I think I'm reasonably comfortable just because I've had [umm] a decent bit of practice and I've seen a few people have the conversations. But I think a lot of it comes down to the patient though, [like] sometimes you just have a patient who puts up a lot of resistance and you can tell they don't want you to talk to them. And sometimes it's honestly because they're older and you're younger and they're [like] you're still a student, [like] what do you say to me? But I do think that there are the patients out there who are also very willing to have the conversation and part because they are in pain and they are [*stuttered in speech, repeated dialogue*] they know people who have been addicted and they know people who have had problems with drugs, [umm] whether it's narcotics or not. And so I think that also, just keeping them in mind, makes it a lot easier to have the conversations.

Participant 3:
I also think too that [like] when I have [like] discussed having those conversations with people, I feel like people think that that one conversation is going to [like] solve that patient's problem. Where [like] a lot of times you really just have to [like] meet them where they're at and [like] maybe it's just [like] giving them a resource to read when they go home [like] about their medication and [like] that's [like] enough to kind of maybe get them to start thinking a little bit more [like] maybe referral to Narcotics Anonymous. [like] They've [like] [*stuttered in speech, repeated dialogue*] I feel like there's this [like] conception that [like] that conversation is going to solve everything and [like] less about just [like] meeting them where they're at because ultimately [like] you could throw a thousand resources at them or [like] have a thirty-minute long conversation. But if you're not actually talking about them, [like] we're talking about with them what they want to talk about or [like] meeting them where they're at, and [like] their journey [like] with their disease, you're really not going to [like] accomplish anything at the end of the day and [like] sometimes, depending on the setting, it might take a couple of conversations and I know not all specialties are [like] fortunate enough to have that [like] longitudinal care but even if you know you're only going to have one conversation with that patient, you're better off just [like] meeting them where they're at than [like] trying to [like] force this [like] outcome upon them.
Moderator:
I think that’s a really great point and it kind of ties back to [umm] one of the themes that we were talking about earlier, kind of like that patient [like] the holistic approach to pain management [like] remembering that they are human, remembering that they're not [like] some number on a sheet. And really kind of, like what you said, [like] meeting them where they're at. [umm] And, you know, because you know you're trying to treat their pain rather than [umm], you know, especially for those who may really need it especially [like], you know, end of life care or cancer

patients, sickle cell for example. So yeah, one anybody like to add on to that question? We can move on then. Oh sorry, go ahead, [**redacted name of Participant 1**].

Participant 1:
You're good, I was just going to say that [**redacted name of Participant 3**] killed it, that I don't have anything to add.

Moderator:
[umm] So on a similar note, I'm interested in knowing if there are any hesitations, barriers, or [umm] gaps in knowledge that you are concerned about as you think about prescribing opioids in your future careers?

Participant 3:
I think a hesitation for me is always [like] how the patient will [like] receive the conversation. Because [like] a lot of times people you're prescribing opioids to don't necessarily [like] have an issue with misuse. It's just your duty to have a conversation with them about [like] a really serious medication that could have really serious [like] side effects or [like] deadly outcomes right? If it's [like] misused. I always get nervous that [like] patients will automatically just [like] assume that they are a certain way because I'm having this conversation out of [like] duty to [like] their overall well-being kind of thing [like], I don't want my patients or [like] just to, blah I can't speak [*laughter*]. I don't want my patients just to [like] assume that [like] I think the worst of them. [umm] Because [like] I wouldn't, you know what I mean? But obviously when you're having that kind of conversation, there's stigma surrounding it even when [like] you're talking about in [like] the best of ways, and that's just [like] a hesitation that I would have.

Participant 1:
Yeah, I agree with all that and just kind thinking a barrier would be [like] just the experience needed to [like] get the, you know, little details down of [like] who needs this much versus who needs that much and who do I have [like] longer conversations with versus who do I not have to have those conversations with and [umm] I think there's a lot of [like] art they have [like], kind of a kind of corny term, but an art of doctoring kind of stuff at my med school. And I think that's [like] [*stuttered in speech, repeated dialogue*] there's some truth to [like], you know, really not everything's [like] going to be cut and dry right out of a textbook and that's how it goes. I think [like] yeah, the hardest thing would be just kind of [like] figuring out the little variations, patient to patient, on how to best manage somebody with opioids and everything else.

Participant 4:
And I also think, just [like] evaluating to my own biases [umm] and I think always kind of [like] assessing where you're at. Because I think it gets easy to [*stuttered in speech, repeated dialogue*] [like] burnout is [like] such a [like] buzzword [umm], but I think it's easy when you're feeling

tired or stressed. [like] Some certain things slip and I've seen it, kind of, with providers and how they approach these conversations. [umm] Just a level of fixed need there and so [like] how do you kind of [like] recognize that and [like] make sure that you're [like] keeping that in mind and always trying to [like] assess [like] how you're doing that aspect. So I think it's just kind of, maybe not necessarily a worry, but then [like] kind of an active thought [umm], you know, going into residency.

Moderator:
[**redacted name of Participant 4**] could you further elaborate on what you mean by [like] assessing regarding [like] one's self when they're prescribing.

Participant 4:
Yeah, I mean, I think I mean, I was kind of thinking more about assessing in terms of [like] one's like self in terms of [like] how they're feeling in that moment and, you know, are they experiencing burnout? Are they [like] at the end of [like] a twelve-hour shift and [like] just [like] exhausted and [like] don't have it in them to have this [like] important conversation. But [umm] I think [like] we've talked about, [like] in our small groups, just [like] ways to kind of [like] check-in with yourself. It can be different for everyone but kind of [like] taking [like] a second before you enter the room to just [like] have like five seconds for you. But I think that itself takes a lot of work and reminders to [like] moments where you can [like] be reflective throughout today. So yeah, I think that's kind of where I was going with that.

Participant 2:
I think [**redacted name of Participant 3**] kind of said the main concerns I have with [like] trying to have that conversation with the patient, but not really highlight the stigma so that they don't feel as if they're being stigmatized. [umm] But then my other concern is finding the time and being honest with myself to make sure that I find the time to have those conversations because when you're running around trying to be patient after patient and your pager is beeping, do you really [*stuttered in speech, repeated dialogue*] it's easy to say now, but in ten years, do you really take the time every time to have those conversations with the patient? And [umm] I think currently we don't really do it at all to be quite honest. [like] I've been on the patient-side and you wake up from surgery and you're in pain and someone just pushes pain meds into your IV and you have no idea what they gave you and you can ask, but [like] then when you're being discharged, you know, the doctor wrote a prescription for you but [like] did they tell you what they're going to prescribe you? Not really, the nurse comes and tries to have that conversation. [umm] I do think it's more [*stuttered in speech, repeated dialogue*] there's more responsibility, there should be an onus on the actual physician to have the conversation before they prescribe instead of just writing the prescription and expecting the nurse to have time and to take [*stuttered in speech, repeated dialogue*] to take the time to really have the conversation with the patient. And I think one of my concerns is trying to be honest with myself to make sure that I do have

those conversations throughout the career.

Moderator:
Yeah, that's all really great feedback. [umm] I think you all did a really great job [like] highlighting [like] the importance of those [like] really intentional conversations with patients, [like] concerning [like], what [*stuttered in speech, repeated dialogue*] what and how much and over what period of time you're prescribing an opioid [umm] and of course, [like] I'm sure different physicians approach those conversations differently, I guess that like at a baseline level. So another question that I thought of while we were discussing this, I know some of you mentioned [like] burnout and exhaustion, especially leading up to those conversations, I was wondering if anybody could think of any factors that they may [*stuttered in speech, repeated dialogue*] that may affect prescribing behaviors just in general. Whether it's, [umm] or if anybody has any experience with seeing this happen in real time or any information that you know, or any guesses that you may have as to different factors that may affect prescribing behaviors over time.

Participant 2:
As awful as it sounds, I do think that some of it just comes down to burnout, being tired, long shifts, [umm] being pulled in every direction to see different things and do different things that it's a lot easier to prescribe something that you know you've prescribed to other people, numerous times and so you assume it's going to work for this one. And you don't have the conversation and it turns out that person may have never had a narcotic before but they have extensive family history of addiction to opiates and [like] perhaps having the conversation beforehand or even avoiding opiates would have been a better idea. And also, some of it is unfortunately you kind of are affected by the patient you just saw before you go see the next one, so if you're spending all this time with someone who is drug seeking and insistent on getting all of the [umm] strongest drugs, although they don't need it, you might be worn out and then you go to the next patient who is actually in pain and you're kind of just dulled by the previous conversation and you're not really treating their pain as much because of that. So I think there's [*stuttered in speech, repeated dialogue*] there are a bunch of factors and we could go into like understaffing of hospitals, I mean, or, you know, the fact that like fentanyl freaks out patients now if you tell them that you're giving them that because they hear about the dangers of fentanyl on the streets. So there are a lot of things out there but I think those two are kind of big ones that I've seen, and that I think are a bit more subtle.

Participant 1:
Not much to add, I think all those are pretty great points. I think just the [*stuttered in speech, repeated dialogue*] the busyness of the doctor schedule [like] it gets to the point, seems [like] that they just try to streamline everything as much as they can to [like] make their time as efficient as possible. And so things like long conversations or even short conversations [umm], you know,

kind of get passed off to somebody else or nobody. So I think that's [like] something that, you know, burnout is certainly a factor and just in terms of people trying to be as efficient as possible that kind of results sometimes.

Participant 4:
Yeah, I don't have too much to add. I agree with what everyone said.

Moderator:
Okay, great. So as we conclude our discussion, what else would anyone like to share?

Participant 1:
Not much else to share. I'm curious to know what kind of [*stuttered in speech, repeated dialogue*] where this goes and what you've been hearing from other students and kind of what your ultimate, you know, conclusions will be on how to, you know, affect med school education or anything else, as a result of all this?

Moderator:
Yeah, well, you're the first group that I've talked to about this so far. [umm] So I mean, all of your feedback is really insightful. I think especially in my case, as somebody who doesn't identify as a medical student, [umm] but has worked in clinical settings and has the perspective of somebody who's studying public health but then also knows the clinical context. [umm] I think it's all really interesting. And I understand that the education part of it is not very standardized across the United States. [*participants nodding*] So I'm really interested in examining, you know, how that can change. This is all really important. There's very little qualitative knowledge on the perceptions and attitudes of how you all experienced this education. I think that's really important in guiding the discussions for changing this education. [**redacted name of Participant 2**], was there something you were going to add? I saw that you unmuted.

Participant 3:
If you want to look at a state that does a really good job, the state of Massachusetts, their governor has been really proactive, I'd be happy to send it to you. [umm] They have [like] basically [like] a whole set of like learning objectives and [like] things that every medical school in the state of Massachusetts [like] needs to teach with regards to [like] pain management and [like] opiate prescription, and [like] we've been trying to [like] use that to model [like] our stuff off that [like] we're hoping to add them to [like] [**SOM name redacted**]'s curriculum. But they at least, obviously doesn't apply to the whole nation, but [like] the state of Massachusetts at least has [like] a pretty standardized [like], at least on the surface, way of [like] implementing that curriculum, so [like] there [*stuttered in speech, repeated dialogue*] they would be someone good to look at if you [*stuttered in speech, repeated dialogue*] I'm sure you might have seen that already. But if you haven't I can [like] send you the document I found.

Moderator:
Yeah, I think I read about some of that when I was working on my literature review for this and I was like, “Oh my gosh, they're doing such great things.” Yeah [umm] so yeah, does anybody have any other questions or would like to share anything before we wrap up our discussion? Okay, so that was the last question that I wanted to ask you all. Once again. I would like to thank you all for taking the time to speak with me this evening. Your responses will be very valuable and my learning about your experiences with opioid education during medical school. To express my gratitude for your participation in this discussion, a $10 amazon gift card will be sent to the email address you indicated in REDCap. [umm] So one thing I wanted to know about the gift cards, because this is my first group, the billing for the gift cards by the research PI's is in the process of being approved, so you may not receive your gift card in the next several days, but I promise that you will receive it as soon as humanly possible. I promise I will make sure of that. Also, if you know of anyone you believe would be interested in participating in a future focus group discussion, [umm] please feel free to provide them with my contact information. And if you have any questions about this study, please do not hesitate to reach out to me in the meantime, I will get back to you as soon as humanly possible on that and try to address any concerns or questions that anybody has. This concludes our focus group, I'm going to go ahead and stop recording.

APPENDIX G: FOCUS GROUP #2 TRANSCRIPT

Date: October 20, 2022
Time: 6:00pm
Duration: 47 minutes, 40 seconds
Location: Zoom
Moderator: Angelina Luciano

Key
[*italics*] italicized words contained within brackets are nonverbal actions or behaviors [**bold**] bolded words signify that information was removed from the transcript as a means of protecting the identities of the participants [not italics/bold] non-italicized words contained within brackets are verbal words that are not designated as speaking; words or sounds used to fill space but don't remark on spoken phrases [*not italics/bold*] non-italicized words surrounded by asterisks contained within brackets are important notes regarding preceding words or phrases
Examples: [**name redacted**] [**SOM name redacted**] [*undistinguishable audio*] [umm] [hmm] [like] [*pause*] [*laughter*] [*nodding*] [*stuttered in speech, repeated dialogue*]

Moderator:
So I'm going to go ahead and press record. Alright, okay. So thank you all for agreeing to participate in this knowing it's recording. [umm] So we can get to know each other better, please share your first name and your favorite thing to do to relax. I'll go ahead and get started, my name is Angelina and my favorite thing to do to relax is to read.

Participant 5:
Hello, my name is [**name redacted**]. I think my two favorite things for relaxing are either hiking or watching TV. I like to binge watch Netflix a lot.

Participant 6:
I'm [**name redacted**]. [umm] My favorite thing to do to relax is go to workout classes.

Participant 7:
Hi, I'm [**name redacted**]. [umm] I also like watching Netflix [umm] and then also just hanging out with friends and family.

Participant 8:
Hi, I'm [**name redacted**] and one of my favorite things to do when I'm relaxing is just laying down and listening to music or just going out to eat.

Moderator:
Awesome. Thank you all for sharing. So let's get started by talking about opioids. I understand that opioids may be a sensitive topic for some individuals so if at any point, you feel the need to step away from the Zoom call for a moment, I invite you to do so. If you can recall what were your perceptions and attitudes about opioids before attending medical school?

Participant 7:
[umm] So for me, [umm] so I'm a fourth-year medical student and started in 2018. [umm] And around that time, there was a lot of conversations around [like] opioids, [umm] both [like] prescription and non-prescription use of them. [umm] And so I think I had a very, [like] complicated understanding of opioids. [umm] It was, you know, there was [like] this opioid crisis that was going on and that term, it was very much like a buzz term, especially during [like] my med school interviews. [umm] So I think it was kind of [like] knowing that there's [like], useful [*stuttered in speech, repeated dialogue*] there are [like] [umm] helpful practices for using them but then also knowing that there is also kind of [umm] [*stuttered in speech, repeated dialogue*] going into [like] the medical field, there is also a lot of [like] conversation and controversy really related to opioids as well.

Participant 5:
I would say for me, [umm] I came from [like] a rural community. So there's a lot of stigma around the term and there's a lot of shame [umm] projected onto populations who are [like] victims of the opioid crisis. And I would definitely say [like] before med school, I definitely had learned a lot of incorrect [like] bias from that. And it wasn't really talked about in a way of [like] "oh, this is a systematic problem." It was more so [like] "this is a shameful individual problem." [umm] Which is very unfortunate that that was my experience prior to attending med school.

Participant 8:
My experience was more of [like] [*stuttered in speech, repeated dialogue*] okay, you hear a little tidbits from different news, people or news reporters, saying [like] "oh, there's an opioid epidemic or an opioid crisis." And a lot of people, I think, the term pill mill is something that's stuck in my mind a lot. There are people who are getting opioids [umm] not in the right way or unregulated or poorly regulated way and they were using these then becoming addicted. And I

think one of the big things that I was informed of, because everyone pretty focused [*stuttered in speech, repeated dialogue*] pretty much focused on the fact that you can transition from the prescription opioids to [like] the non-prescription drugs. So I don't think [umm] the focus was just on “oh, people are getting certain prescriptions.” It's “oh, when they can't get these anymore, they're trying [like] [*stuttered in speech, repeated dialogue*] transitioning to [like] more or unregulated or [like], I guess, illicit drugs from that [like] opioid crisis.”

Participant 6:
[umm] I'd say I knew it was mostly about [like] more [like] the buzzword, [like] controversy type things, like controversies about [like] [umm] provider [umm] prescription of opioids, and [like] whether or not that should happen and kind of [like] controversy about whether Narcan should be available at [like] college campuses or just [like] given out. [umm] So I didn't really know as much of concrete facts, more about [umm] [like] there are certain things that people have pretty [like] opposing views about.

Moderator:
Thank you all for sharing that. That's really important for me to know as well. [umm] So reflecting on your prior thoughts, what you just shared, how do you believe that these perceptions and attitudes have changed since enrolling in medical school?

Participant 8:
I think, I guess, for my individual perception and then, I guess, the prevailing perception I'll say two different things. For me, I realized that it wasn't just [like] a buzzword, [like] big term controversy. There are people who are [like] [*stuttered in speech, repeated dialogue*] who are genuinely becoming addicted to these substances, and they were dying in mass and people didn't actually have a good way to say “okay, we need to properly regulate and address this” because it's not like “oh, stop or do more policing on drugs” [like] no, these drugs are substances that you should have access to if you had [like] a bad surgery or injury, but we just need to find a way to make sure that you get them and then we can wean you off of them. So that was my [like] individual perception. And I think what I learned and saw, when I was in medical school, were a lot of providers saying how they have to now regulate how they're prescribing or giving out opioids because they're worried and people having a risk of becoming addicted. I think that was something that was tossed around a lot when it's like “okay, I know this person is in pain, but what is the risk of them becoming addicted to these substances?”

Participant 6:
Same, I feel like I've learned more about [like] risks of people [like] becoming addicted. [umm] I think I've also just learned more about like, “okay, [like] there is a place for these drugs.” [like] before would have thought you just shouldn't prescribe it, people are going to become addicted. But I guess [like] I've been learning more about [like] dosages and then [like] proper [like]

regimens for patients. [umm] So I think, I guess, I've [like] learned more in [like] the medical field, how it should be used, and there's [like] different [umm] [*stuttered in speech, repeated dialogue*] oh, what was it in? [*stuttered in speech, repeated dialogue*] in [like] the palliative care portion. There's [like] a required course for [like] opioids and [like] how they can be used and [like] what signs you can look for [*stuttered in speech, repeated dialogue*] for [like] addiction and [like] where would it be appropriate and where it'd be [like] inappropriate, so that's pretty helpful too.

Participant 5:
I'm a little early in the med school curriculum still, but I would say [umm] I've already [like] had a really good shift in attitude, just towards [like] what actually is [like] mechanisms behind addiction in general, not just with opioids. [umm] So it definitely applies. And then, yeah, I think just to kind of [like] reiterate the dosage thing, and there is a way to prescribe responsibly and there is a good use to treat pain. [umm] It's a very challenging balancing act, but an important one to take on.

Participant 7:
[umm] Yeah, I agree for a lot of the things that have already been said. [umm] Some are really [like] in [like] emergency medicine clerkship. [umm] You know, conversations about [umm] those who may have come in, you know, from an overdose and how to manage that. And then on the side of [like] provider prescribing behaviors and, you know, how [like] more regulated it is than I was aware of before entering med school, so [like] the [like] state databases [umm] of [like] who has been prescribed what [umm] is something I didn't know about before entering med school, but then have seen in practice [umm] since being in med school.

Moderator:
That's all really great feedback. [umm] Thank you all for sharing that. So, another question that I have is how would you describe the education you've received regarding opioids during your preclinical semesters, specifically, while in medical school?

Participant 5:
So, I'm still preclinical. [umm] So far, we have received [umm] some [like] introduction to it I would say that actually there's [like] a student initiative going on right now where they do [*stuttered in speech, repeated dialogue*] I think they're called like the addiction medicine recovery group or something along those lines, and they've actually [like] spearheaded a lot of naloxone trainings. [umm] It's outside of the curriculum, and they're working to get it incorporated. But if you [like] take one of their trainings, it's actually really informative [umm] and still extracurricular. But that's [*stuttered in speech, repeated dialogue*] I would say I got more information from those sessions than I had [like] with the curriculum structure if that makes sense.

Participant 7:
Yeah, [umm] its been some time now since I had the preclinical portion but from what I remember it was [like] we had maybe [like] a small group, you know, conversation about [like] a problem-based [umm] case, where that way [like] opioid prescribing was mentioned and talked about a little bit. And then we had [like] a patient encounter situation as well where that was discussed. [umm] But I feel [like] it probably, from what it sounds like, [like] we didn't have a small interest group or anything like that, like any extracurricular to my knowledge at the time. [umm] So that definitely is something that's new [umm] at least in the past three [*stuttered in speech, repeated dialogue*] [like] three and a half, four years.

Participant 8:
And, [umm] yeah, I'm similar agreement with [**redacted name of Participant 7**] and I believe that also a lot of our information was concentrated near the end [like] because I think we have our psych module, or at least when I was in preclinical near the end of the, I guess, second year, so I know remember getting a lot of [like], "okay, okay, this is how you treat all these conditions, these were all these procedures," and then at the end it's like, "okay, well, this is what our classical definition of addiction is. These are the substances, this is how we assess it," and that kind of being near the wrap up, almost ending, of our preclinical education. [umm] So maybe some of the things that we learned before could have been informed if we'd had it a bit earlier or maybe informally, but I remember it being [like] kind of concentrated near the end.

Participant 6:
I don't [*stuttered in speech, repeated dialogue*] same as them honestly [*laughter*].

Moderator:
Well, thank you all for sharing. So [umm] for those who this applies to, for those who have become clinical rotations or clinical training while enrolled in medical school, [umm] was this information that you've learned during your preclinical semesters, beneficial or lacking, in any way as you began clinical training?

Participant 7:
[umm] So for me, similar to what [**redacted name of Participant 8**] had mentioned, you know, the information was very much was [like] at the end right before we started to preclinicals but I would say it wasn't [like] the most in-depth amount of information. [umm] And I think also because of where it was placed, it was [like] right before we started studying for our board exam. So a lot of things [like] right before that time, if it wasn't testable on the board exam, I felt [*stuttered in speech, repeated dialogue*] I think it kind of [*stuttered in speech, repeated dialogue*] not a lot of [umm] attention was paid to it. But so I think, starting clinical time, then that [*stuttered in speech, repeated dialogue*] it was kind of [*stuttered in speech, repeated dialogue*] it

was [like] relearning it again, at least that's how I felt. [like] It was either [like] learning information now for the first time or learning it again, or it just was very new so it was different and I don't necessarily [*stuttered in speech, repeated dialogue*] I didn't feel as if [like] I felt prepared [umm] to encounter that in a clinical setting with [like] real patients [umm] based on [like] what we had been given before.

Participant 6:
Think that what we learned preclinically was more [like] mechanism of action, things like that instead of [like] the clinical use of it. So [umm] being [like] in the wards, like in internal medicine, I had to learn a lot more things. I learned it from [like] interns and residents about [like] actually applying [like] these drugs to different patients. So I would say kind of the usefulness is kind of separate.

Participant 8:
I haven't done my [like] formal [umm] clinical training yet. So I haven't been able to see it applied [umm] in a clinical setting. So I only know what I was taught up to the preclinical phase.

Participant 5:
Yeah, and I'm also preclinical. I haven't gotten that small group yet. But I am in the middle of psych, so maybe it's coming up. But [umm] as of right now, I definitely don't feel prepared. [umm] But again, [*undistinguishable audio*] different days, so that might not apply.

Moderator:
That was all really great information. [umm] Thank you for sharing it. I think it's interesting how kind of similar to what was said about [like], you know, you learn about [like] the mechanisms and maybe the biochemistry of it and your preclinical lectures, but then switching into [like] a clinical practice of [like], well, how do we apply what we've learned and how do we communicate with patients and so it's really interesting to me to hear [umm] the level of preparedness that you feel going into [*stuttered in speech, repeated dialogue*] going into it. So thank you all for sharing. So, similarly to a question I had earlier, [umm] how would you describe the education regarding opioids that you receive specifically in a clinical setting, [umm] such as an experience from a provider or an attending or resident, if anything sticks out to you I'd be interested in hearing.

Participant 7:
[umm] So a few, I think, one I think maybe [like] the earlier experience that I had was during my internal medicine rotation, [umm] that was [like] my first clinical rotation [umm] and having [like] a resident lecture on [*stuttered in speech, repeated dialogue*] [like] for a patient that was going to be prescribed opioids in the hospital during their admission, [like] the best ways of [like] converting to different types of opioids and making sure that [like] you have [like] the

appropriate dosing and [like] going through kind of mechanism action, but also [like] duration of the medication and [like] what that would look like when they leave the hospital, if they would need to have that prescribed for them. So it was, I think, maybe it wasn't [like] a formal didactic for [like] everyone in the clerkship. It was [like] my resident on my team [like] sat down with [like] the interns and medical students [umm] with the attending there as well and kind of [like] went through that. [umm] Which was [like] really helpful, I [like] still have those notes today. [umm] And then another clinical example is [like] during my emergency medicine rotation that I recently took, [umm] we had [like] a didactic where that was [like] one of the cases we talked about was related to [like] overdose and then [like] management of opioid overdose, [umm] and then during the actual rotation, [like] encountering patients and having [like] discussions about that in real time with our team. So definitely [like] opportunities to have [*stuttered in speech, repeated dialogue*] I've had opportunities to kind of discuss this [umm] in different settings.

Participant 8:
I know it wasn't a formal clinical experience, but when I was working with one of the providers, they're talking about how some of their [like] research works on non-opioid based [like] chronic pain health. So [umm] I think they said a lot of good or a lot of funding was available, at least for them clinically, because they worked in pain management to try and [like] find or investigate new ways of chronic pain relief because they realize it's an issue. [umm] And they were talking about different forms of deep brain stimulation and other devices and acupuncture that people are trying to have rolled out in the clinic so that they can give people [like] alternatives to opioids because other [*stuttered in speech, repeated dialogue*] while there are other classes of drugs that are available, there are some people who are very much open to non- [*stuttered in speech, repeated dialogue*] I guess pharmacologic pain management either. [umm] Also, and I think that's something that I saw a decent number of clinicians in pain management [like] looking into active research on, so I thought that was good because they're giving it to their patients and I think some of the work that they will eventually publish could kind of help people have access to these [like] devices and [like] means of care.

Participant 5:
So I'm not [*stuttered in speech, repeated dialogue*] this isn't like, formally clinical, but we do have patient interviews, and we recently had someone come in and it was unrelated, but she was describing how [umm] she had a history with addiction and we were kind of taught very briefly, that there are non-addictive opioids. [umm] I think codeine was brought up. And she was saying how [umm] she has to be really aggressive about not getting prescribed that by doctors even with her addiction history, which I thought was interesting and how, even though she knows that [like] technically it's not addictive, she has many friends who she knows would pharmacy hop looking for that substance specifically. So there's [like] a perception on her end that that's still very addictive, and how she sometimes feels like it's not respected or not thought of on the provider side. So that's an interesting experience I have [umm] with her perspective on that.

Participant 6:
I think that [umm] sort of formal clinical teaching or training about opioids has been limited. I can't really think of any instances other than, you know, just being on the wards and [like] an intern pulling out a piece of paper and being like, "okay, this is what we usually prescribe for pain [like] at these pain levels [like] for these conditions when this is what we usually prescribed," but nothing really formal that sticks out.

Moderator:
That's all really great to hear. [umm] Thank you all for sharing that. So another question that I have is in what ways have you felt academically or even professionally supported in your learning about opioids during your time as a medical student?

Participant 5:
I feel like the students in my class that are doing that [umm] interest group have really been supportive and awesome points of contact for learning more about this, which has really been a great resource that I think is probably new this year from the sounds like, and they have a couple of contacts [umm] with [like] two or three physicians who are just being really good about reaching out, [umm] but it's definitely not a formalized process. I feel like it's kind of [like], a passion project is a wrong use of the [*stuttered in speech, repeated dialogue*] it's not what I'm meaning but these physicians are going out of their way to help us and [like] come out during [like] outside of class times and teach us these things. And it's really spearheaded by individuals who are taking [like] the time and care to integrate it for us. So I feel supported from them and would really like to see it get adopted into [like] the overall structure, so hopefully that will come about.

Participant 7:
[umm] Yeah, I think it's because [like] I think it's very much there's [like] a lot of growth and [like] opportunity in incorporating this more formally into the curriculum, both preclinical and clinical. [umm] But I think [like] through this interest group, it sounds [like] there is [like] support to do that. And I know there [like] some like elective opportunities that people can do as well [umm] related to [like] addiction medicine. [umm] And so [like] it's there. It's just not [like] standardized, I think across the med school curriculum.

Participant 8:
And I think that one of the [*stuttered in speech, repeated dialogue*] I don't want to say reasons, or maybe it could be looped through different threads throughout the curriculum, or [like] in different modules, per se, because I think that's how everything's broken up. Because if you have to go to an interest group, or do this and see something, everyone might not get the same exposure. So we don't necessarily all know what everyone knows is posted, "okay, if this was in

these lectures, then we'd all kind of have the same [like] baseline and can go and build on what we're getting an experience for clinically," I feel [like] you just come in with different levels. So you have different [umm] clinical experiences, because you come in, you ask different questions because you've been exposed to different things. So I think that's a reason why some of it's [like] a little different for each person.

Moderator:
[**redacted name of Participant 6**] is there anything you would like to share as well?

Participant 6:
I don't have anything new that wasn't said before.

Moderator:
Okay. Just want to make sure. So that's really interesting to me that you [umm] all for the most part [like] mentioned [like] peer support, especially concerning the interest group at [**SOM name redacted**], so that's really interesting for me to hear. [umm] Concerning [*stuttered in speech, repeated dialogue*] I guess [like] support from faculty or superiors [*stuttered in speech, repeated dialogue*] I don't want to say superiors, but those who instruct your courses, those who instruct clinical training, would you feel comfortable approaching someone with questions about opioids? Do you feel like you would know how to do that in the event that you had any questions that you needed to answer?

Participant 8:
I feel like yes after any, again, [like] preclinically lecture wise, a lot of people are very open to talk afterwards or [like] during a break session, so you can sit down and ask them specific questions. And if they feel like a question is something that they would want the entire class to have information on, they'll definitely mention it. [umm] So I don't think there's any hesitation there. I just feel like a lot of what we do is broken up by body system. So it's not necessarily like, okay, of course there are doctors in all of these [like] modules who have patients who are on pain medication, and some of those might be opioids, but I feel like you really only get the people who have [like] a lot of consistent exposure to them and maybe [like] sight from an addiction perspective, not necessarily like a mechanism of action like we talked about earlier. And I think, clinically, a lot of people are very open because they're like, "okay, well, this is what I prescribed. These are some of the symptoms and things that I have to look out for," but I don't think there's [umm] any fear or hesitation. It's more so how much does this clinician actually interface with opioids directly as opposed to if this patient is on an opioid just because of some surgery or experience that they have and they need it.

Participant 6:
I think, clinically, I would feel really comfortable reaching out to one of my attendings,

especially on psych. I know they would all be very open to have [like] a whole [like] talking point if I wanted to know more about opioids or [like] internal medicine. [umm] And some of the other sort of clerkships, I think that their openness would only be limited by how often they're prescribing them. [umm] But I don't think I'd have an issue with speaking with them at all.

Participants 5:
I agree that our lecturers do [like] make themselves available [like] outside of class like [**redacted name of Participant 8**] was saying. [umm] I think I feel comfortable going with the question. It's just sometimes I feel like I don't quite know what questions are [like] pertinent to be asking, it's [like] hard to navigate. [umm] And maybe this will get better [like] when I see it applied clinically, and I just can't picture it now. But it's really hard for me to understand what questions I should be asking, [like] is it pertaining to dosage or [like] right now we just know mechanisms of action, like we've been saying, so I definitely agree with a lot of those points. And yeah, I don't think I feel comfortable with my own ability to ask the right questions, I guess is what I'm trying to say.

Participant 7:
[umm] Yeah, I agree with what was said. I would feel, you know, comfortable asking and I think that [umm] feeling comfortable about what to ask is a thing that continues throughout med school, right? Making sure that you [like] [*stuttered in speech, repeated dialogue*] what you're thinking, you're [like] conveying that in the right question. [umm] But I think there's not [*stuttered in speech, repeated dialogue*] I personally would have not felt [like] a fear of asking about opioids, either prescribing practices or, you know, addiction or [like] risks related to that.

Moderator:
Thank you all for sharing that feedback. So another question that I have is that [*stuttered in speech, repeated dialogue*] so I personally am interested in learning more about the specialties that you all intend to pursue. [umm] So if you feel comfortable, please name this specialty and describe how often you anticipate prescribing opioids in your future practice.

Participant 7:
I can go first since I'm currently applying to residency right now, so I am applying into pediatrics [umm] and I currently am not sure, you know, if I'll subspecialize and I think really, you know, the biggest field where I would potentially be prescribing opioids most commonly could potentially be [like] hematology oncology. [like] If I was [like] in sickle cell, you know, [like] working with patients that have sickle cell disease is. I think currently the place where I think I would be using that most often. [umm] But as [like] a general pediatrician, I don't think as much [umm] so I may have [like] limited [*stuttered in speech, repeated dialogue*] actually limited clinical experience with that in the future, but we'll see.

Participant 8:
So I'm planning on going into anesthesia. Granted, I'm a ways off from a residency application. And I think that's [*stuttered in speech, repeated dialogue*] you have a lot of interface with a lot of drugs and opioids. I know the specialty pain management within anesthesia is a heavy [like] chronic pain, heavy prescribing and drug management. [umm] And a lot of what they do, they are at the forefront, a lot of opioids and people who have long-term needs for those medications. [umm] Do I see myself going into chronic pain or pain management anesthesia specifically right now? I don't know. But I also know that, for the most part, you do use a lot of things, [like] there are fentanyl syringes in every operating room. And even though you're not necessarily prescribing opioids, you might be most people's encounter with an opioid. [umm] And you do kind of have to talk to them a little bit about like, "hey, these are some of the drugs that we use. These are why we use them. This is how we expect these things to work and the surgical team, I guess, will kind of manage you afterwards and make sure that [*stuttered in speech, repeated dialogue*] make sure that what we did to make you comfortable kind of doesn't do too much damage with what they're trying to do." But I think that anesthesia, for the most part, has a lot of [like] active drug use, but you see the majority of that [like] chronic pain management in chronic pain anesthesiologists.

Participant 6:
I'm interested in pediatrics or psychiatry. I guess in general pediatrics it is possible that I could have patients who have chronic pain, but I think that [umm] definitely would not be as often [like] prescribing as if I were to go into psychiatry. [umm] And that would be, I guess, working with patients who have [like] substance use disorders and they may need [like] long-acting opioids or [umm], I guess, for [like] antagonists to help with [umm] their treatment.

Participant 5:
So I'm new to be [like] picking but I'm interested in either radiology or radiation oncology. So I would say [like] on the radiation oncology side, I could see maybe at least being on a team that is making some of those decisions for prescribing. I don't know exactly [like] if my role would be overseeing that part of it specifically. [umm] And then as far as [like] the radiology side, probably not much. [umm] If I was to do interventional radiology, then you're doing procedures so then that aspect kind of comes in, but I'm not familiar with how much [like] that would be my role directly or anesthesiology's role or a different provider's role. So unsure, that's probably [like] the best answer.
Moderator:
That's okay. That's so great, I love that you said radiation oncology. I worked in radiation oncology for four years when I lived in Chapel Hill and met some really incredible doctors up there, one that had an MPH and I'm getting my MPH. So I love that that all comes full circle. [umm] So regarding the opioid education you've received thus far in medical school, do you feel prepared to encounter opioids when you enter residency in the field of interest that you have?

Participant 8:
So, I'm a ways off. But I would say, with the support of a team, yes. I feel like a lot [*stuttered in speech, repeated dialogue*] [like] you can know the preclinical, how this drug works, what to expect, maybe [like] signs of addiction, but until you see opioid used in your specific setting, I think that kind of gives you a bit more information on [like] what your day-to-day is going to look like. And I think just being able to approach it with an open mind, having good terms, and being able to [like] speak to people and not use terms that may be offensive when you're talking about opioids is something that I think we learned a lot about in our [like] preclinical and patient engagement. [umm] So yeah, I think I'd say I'm equipped but I feel like that's a lot of [like] one-on-one, I guess, peer experience learning that you get, so yeah.

Participant 7:
I agree with that. I think with [like] the support of a team, [umm] I definitely would feel, you know, equipped doing that and I think [umm] based on [like] our current training [like] knowing, you know, the major [like] risks of that when you prescribe an opioid and knowing, you know, [umm] the importance of [like] regular check-ins and things like that with [like] [*stuttered in speech, repeated dialogue*] with anything in medicine, but you know, I think I would feel comfortable, again, [like] with knowing that I also have support and people who I can reach out to and what resources to use, [umm] if I ever had any questions.

Participant 6:
At this very moment, I don't feel equipped, but I think with more clinical time and sort of, I guess, making those decisions and getting those checked as [like] [*stuttered in speech, repeated dialogue*] as an intern you're going to be working under an under an attending so they're going to be signing off on everything. So I think [like] with more time actually [like] making those decisions, I'll feel more equipped. [umm] Kind of [like] as a third-year medical student, I'm not making those decisions. I'm just watching someone else do it. But sort of being pushed to do that research and actually see what would be best for the patient. I think it'd be pretty equipped.

Participant 5:
Yeah, I feel very similar as in I'm not [*stuttered in speech, repeated dialogue*] I don't feel equipped right now. [umm] I'm hoping that it's to come. I do think that [umm] we get a good education with how to approach the subject and build rapport with patients and I really appreciate that and [like] all the training we get on how to [umm] just understand [like] all the [like] factors that go into addiction and just the reframing it's been very helpful for me coming from that background that was [like] very conservative, very rural and yeah, I'm relearning some of those schemas, I guess. But yeah, with the support of a team, I think I could do well. But I [*stuttered in speech, repeated dialogue*] I still need more clinical time before I'd be comfortable.

Moderator:
Absolutely. Thank you all for answering. So, are there any hesitations, barriers, or gaps in knowledge that you are concerned about as you think about prescribing opioids in your future careers?

Participant 8:
[umm] I think my only hesitation is [like] what happens long-term. I guess, if you're in chronic pain anesthesia, then you will see the patient regularly. But I think one of the issues that happens is that people are sent home on opioids, but because your anesthesiologist isn't your [like] primary care doctor and they don't really see you again, you're just gone into the abyss and we don't know. No one's [like] following up say, "hey, what's going on? How is your dose? [like] Are you still actually in pain and offering them [like] alternative solutions?" They might just say [like], "oh, this person needed this and then it needs to be refilled based on my current understanding." There's not a lot of [like] repeat patient contact there outside of chronic pain. So I think that's my only hesitation, [like] losing contact with a patient that had a prescription and not knowing a week or two weeks out how they're feeling about their usage, if they feel like they don't want to have that type of prescription versus you being [like], "well, you know, because you need this because you're in so much pain because of this procedure experience, this is kind of our best bet" because all of the alternative methods really only work for, I guess, what could be [like] post-operative care, only some aspects of that so.

Participant 5:
I think my biggest gap in knowledge right now is how opioids can be used successfully without [like] the outcome of addiction because just with experience and then the little bit of [like] clinical exposure I've gotten it's all been in reference to addiction but obviously there's [like] use for these medications and they have really good benefit for people and can be [like] prescribed in a responsible way. So I would [*stuttered in speech, repeated dialogue*] I guess I need more information on just seeing how it can be applied appropriately.

Participant 7:
I think my hesitation or hesitations that come with [like] any prescribing of any medication or any treatment is just [like] knowing that there are risks [umm] and there are [*stuttered in speech, repeated dialogue*] you know, can be adverse outcomes. And so just I think that's [like] where the biggest hesitation comes in. [like] why the importance of having that support of a team and having resources available [umm] is important. [umm] Yeah, that's the biggest thing for me.

Participant 6:
I guess my only [*stuttered in speech, repeated dialogue*] well, one of the fears or hesitations would be [umm] letting [like], I guess [like] stereotypes or [like] fears [umm] sort of affect how I'm treating my patients. [umm] Or not treating them to the best of my ability because, you know,

I'm afraid that [umm] [*stuttered in speech, repeated dialogue*] I'm afraid that, “oh, there's a slight chance that maybe they're malingering and they're not actually in this pain,” [like] letting instances like that affect the care of my patients.

Moderator:
I really like that point, thinking about [like] the potential patient interaction and thinking over how they're presenting their symptoms and, you know, are they really in pain? How do I have to approach this? [umm] I know the term “drug seeking behavior” gets thrown around a lot specifically with opioids. [umm] So I'm also interested in what other factors do you believe influence prescribing of an opioid to a patient? [umm] So for instance, a lot of the literature states [umm] that there are a lot of racial disparities such as white patients being more likely to be prescribed an opioid compared to those who identify as a racial minority when presented with the same pain symptoms.

Participant 7:
[umm] Yeah, I think that [like] I think some of the influences, [like] what influences [like] provider prescribing behaviors and just [*stuttered in speech, repeated dialogue*] I think, just general practices are you know [*stuttered in speech, repeated dialogue*] you know, either personal experiences or assumptions that are made, you know, from life outside of medicine [umm] in incidences [umm] and that [*stuttered in speech, repeated dialogue*] I'm trying to think of the best way of saying this, but I think to the point of just [like] greater [like] structural racism, you know, that occurs within the medical field and the ways that that can consciously and unconsciously affect people's behavior. [umm] So I think [like] that's definitely an influence and something that even as [like] a student and a learner [like] being on rotations, and having patients [*stuttered in speech, repeated dialogue*] [like] patients that are in pain, and [like] talking with the team about [like] how to manage that pain, those [like] thoughts have [like] come up and I think the way that [like] I asked the question is really just one of like curiosity of [like], “how are we thinking about this person's pain?” And then are we doing everything that we can to make sure that that person is receiving the care that they need? [umm] And [like] not, you know, not without making assumptions myself about what people's [like] assumptions are about the patient or their background or anything like that. So I think it, yeah, definitely becomes tricky with, you know, the opioid [*stuttered in speech, repeated dialogue*] with opioids because of the things we talked about the beginning of this session, of kind of our own experiences of, you know, what it was, you know, how it was presented to us before even entering med school, and then we encounter [like] our attending physicians and residents and people that we work with, who are also the people that are teaching us about what their experiences are and how they view medicine and how they view patient care. [umm] So I think there are a lot of influences and a lot of it isn't necessarily just [like] medical training. It's a lot of things that come before medical training [umm] and outside of medical training that unfortunately, and fortunately, [umm] influence how we think about [umm] patient care.

Participant 8:
I feel like [umm] kinda [like] what [**redacted name of Participant 7**] said only [*stuttered in speech, repeated dialogue*] the only differences that I've seen are [like] racial and ethnic [umm] backgrounds, influencing who got prescribed opioids, and I don't know if that's going to change because I don't know if, like she said, the overarching [like] structural racism that you see in medicine is going to change. Even if you change the way you approach opioids, there are people who have other biases and beliefs that still are going to inform who they feel like is in pain, who they feel like it's more likely to become addicted or less likely to become addicted. [umm] Maybe there might be some [like] a socioeconomic or just an economic aspect too because I don't know if the cost of any of these drugs but if you are insured versus uninsured, what the price of some of these opioids or prescription opioids drugs cost that might kind of influence whether or not you have to get them or if there are generics available and, if there aren't, [umm] what you can afford so you might be given a non-opioid pain medication because they are just under the assumption or are aware of the fact that you can't afford it. So that might influence who gets access to opioids and who is at risk of becoming addicted [umm] as time goes on, but besides that, I don't really know anything outside of that.

Participant 6:
On the provider side, I don't have exact data, but I would guess that the number of years that someone has been in practice would also sort of affect [like] how likely they are to prescribe something. [umm] Again, I'm not one-hundred percent sure, but I would think maybe that someone [*stuttered in speech, repeated dialogue*] I guess they can go both ways. You could say that "oh, maybe someone that's younger hasn't been in practice is maybe more wary to treat pain and they would be more sort of conservative prescribing opioids" or you could say that someone who's younger doesn't know as much it may just be more willy-nilly with prescribing, I don't know, but I think that how many years the provider has been in practice might affect that too.

Participant 5:
I would also say [like] another factor is definitely [like] each provider's implicit bias, like what they bring into the situation. [umm] Especially [like] with the research you were citing how it was the same [like] pain symptoms presenting, but it was changed based on [like] a racial status, [like] with the racial minorities, so obviously, there's probably some individual implicit bias there. And then on top of that, like [**redacted name of Participant 7**] was mentioning, with the structural side of that as well, so you're [like] battling it from both [like] an institutional [like] side and then also the individual learned [like] experiencing since you're bringing in that side as well. So that would definitely be like barriers, I think, to having equitable prescription of opioids.

Moderator:
Yeah, that's all really great feedback. Thank you all for sharing that. So as we conclude our

discussion, [umm] would [*stuttered in speech, repeated dialogue*] what else would anyone like to share? [*pause*] [umm] So that was our last question, that concludes our discussion. So once again, I would like to thank each and every one of you for taking the time to speak with me this evening. Your responses will be very valuable in my learning about your experiences with opioid education during medical school. To express my gratitude for your participation in this discussion, a $10 amazon gift card will be sent to you to the email address that you've indicated to me. So one note about the gift cards is that the billing for the gift cards is being conducted by the research PIs [umm] and that process is being approved. So you may not receive them immediately after this discussion, but I ensure that you will receive them, I promise you that. Also, if you know of anyone that you believe would be interested in participating in a focus group, please feel free to give them my contact information. [umm] And if they're comfortable with me being provided their contact information, please feel free to do so as well. Also, if you have any questions about this study please do not hesitate to reach out to me. I will get back to you as soon as humanly possible. And so this concludes our focus group discussion, I'm gonna go ahead and stop the recording.

APPENDIX H: FOCUS GROUP #3 TRANSCRIPT

Date: November 3, 2022
Time: 6:00pm
Duration: 36 minutes, 30 seconds
Location: Zoom
Moderator: Angelina Luciano

Key
[*italics*] italicized words contained within brackets are nonverbal actions or behaviors [**bold**] bolded words signify that information was removed from the transcript as a means of protecting the identities of the participants [not italics/bold] non-italicized words contained within brackets are verbal words that are not designated as speaking; words or sounds used to fill space but don't remark on spoken phrases [*not italics/bold*] non-italicized words surrounded by asterisks contained within brackets are important notes regarding preceding words or phrases
Examples: [**name redacted**] [**SOM name redacted**] [*undistinguishable audio*] [umm] [hmm] [like] [*pause*] [*laughter*] [*nodding*] [*stuttered in speech, repeated dialogue*]

Moderator:
Alright [umm] so thank you for that. So we can get to know each other a little better please feel free to share your first name and your favorite thing to do to relax. So I'll get started, my name is Angelina and my favorite thing to do to relax is to read.

Participant 9:
My name is [**name redacted**] and my favorite thing to do to relax is to run.

Participant 10:
My name is [**name redacted**] and my favorite thing to do to relax is to just watch Netflix.

Participant 11:

My name is [**name redacted**] and my favorite thing to do to relax is to exercise.

Participant 12:
My name is [**name redacted**] and my favorite thing to do to relax is go to the beach.

Moderator:
Well, thank you all for sharing. So let's start talking about opioids. I understand that opioids may be a sensitive topic for some individuals, so if at any point, you need to step away from the Zoom call, I invite you to do so. If you can recall, what were your perceptions and attitudes about opioids before attending medical school?

Participant 12:
They were the things that people got after surgeries for the most part, especially wisdom teeth.

Participant 9:
I [umm] I had a few people at my high school pass away from overdoses while I was in college. So I think that was my main [umm] thing other than just knowing that they were, again, like [**redacted name of Participant 12**] said, surgery pills.

Participant 10:
Yeah, I guess I thought of them as just pain medication and didn't know too much otherwise.

Participant 11:
Yeah, I also thought of them more as pain medication, either for chronic conditions or after surgery.

Moderator:
So reflecting on your prior thoughts, how do you believe these perceptions and attitudes have changed since [*stuttered in speech, repeated dialogue*] since attending medical school?

Participant 12:
I feel like there's much more of [like] a scientific idea behind them now. And [like] not all opioids are the same. [umm] And also just the inherent good [*stuttered in speech, repeated dialogue*] that the importance of them but also the inherent damage that they can do.

Participant 10:
I agree with the different types. I felt like I learned a lot more about [like] fentanyl and how dangerous, [like] how much more potent it is. [like] I didn't realize, I was just like, “oh opioids, pain medication” or just that different types can be a lot more potent and then I feel like it was made much more aware of the prevalence of them and the potential dangers.

Participant 9:
And I feel that the curriculum around, [like] strengths and relative dangers, but also I think I learned a lot about how [umm] you don't have to be prescribed [like] an insane amount in order to become addicted.

Participant 11:
Yeah, I think medical school opened my eyes more to the crisis of [umm] opioids and how easy it could be for someone to have an addiction.

Moderator:
Thank you all for sharing that. [umm] How would you describe the education you've received regarding opioids during your preclinical semesters in medical school?

Participant 11:
Could you repeat the question?

Moderator:
Sure. How would you describe the education you've received regarding opioids during your preclinical semesters? So [like], the kinds of courses maybe you took, any experiences that stuck out with you regarding what you learned, how you learned it, so on.

Participant 11:
There weren't any particular moments in the curriculum itself that stuck out. But of opportunities that came up from [like] medical school groups, medical student groups, that I went to [umm] two of them where people shared their stories about their loved ones who passed away from opioid use and those moments really stuck with me, but they weren't part of the actual curriculum.

Participant 9:
I think our preclinical curriculum was mostly geared towards mechanism of action and [like] memorizing a list of side effects without really [umm], sorry my dog's making noise, without the [umm] [like] relative importance of the side effects. [umm] And then similar to [**redacted name of Participant 11**], I think I attended two or three harm reduction workshops my first few semesters of med school and we talked about more [like] life examples in there.

Participant 10:
I very much second that point about the mechanisms more just so the [umm] "here's what the drug is, here's what it does, and here are the different ones. And that's great. Move on to the next part of pharmacology." Not really the importance of the dangers and everything.

Participant 12:
Yeah, I would agree [umm] that I think that they started off mostly with [umm] kind of the mechanisms behind them and the different types of opioids, whether that be for pain, whether that be for weaning off other opioids. [umm] And then we did actually have two lectures from the Director of New Jersey Poison Control [umm] who kind of gave us a talk on [umm] overdosing, naloxone, as well as kind of the misconceptions of overdosing that do exist, especially regarding fentanyl.

Participant 10:
Actually, I do you want to add to that we did have a lecture that talked about Narcan and then they did give us Narcan and [like] showed us how to use it everything so I forgot that was something.

Moderator:
Thank you all for sharing that. So kind of a follow-up question I have to that is, for those of you who have begun your clinical rotations, [umm] how do you feel that [*stuttered in speech, repeated dialogue*] [like] do you feel that the information you learned during your preclinical semesters was helpful, or maybe not as helpful, when you were going through clinical rotations?

Participant 12:
I'm only an M2, so.

Participant 9:
I did [*stuttered in speech, repeated dialogue*] we have a required palliative care elective and I [*stuttered in speech, repeated dialogue*], or not elected because required, rotation that [*stuttered in speech, repeated dialogue*] and that's where I think most of the clinical education around opioids is focused. And that's a lot of [like] finding [like] equivalent doses and that sort of thing. And then also, that's where we do a lot of [like], why you should always prescribe Narcan even if you're only prescribing a weak opioid or something like that. [umm] But then, so that's [like] I think is really strong in that rotation, but then if you move outside of the palliative care world, I think the lessons that we learn in the palliative care rotation aren't necessarily followed by all attendings, [like] they're not really modeling that behavior consistently.

Participant 10:
Yeah, I honestly felt like I didn't have much exposure to, I guess even just [like] opioids in general, but [like] even I'm trying to think back even on my [like] surgical rotation [umm] I just felt like they never really brought it up, never really emphasized more curriculum. And then, you know, if the attendings were prescribing them, they didn't talk about it with us. [umm] I just felt like it wasn't really something that was emphasized.

Participant 11:
Yeah, for my [umm] surgical rotation, the only time I remember it coming up was [umm] someone who previously had an addiction a few years ago, and they were bringing it up in a comment of, well it's still [like] prescribed because of the kind of surgery he had [like] he needs still his pain adequately managed regardless. [umm] So it was brought up in that sense.

Moderator:
Thank you all for sharing that. [umm] So the next question I have, this can either be from a preclinical semester or clinical semester or any kind of clinical experience, in what ways have you felt supported academically or professionally in learning about opioids during your time as a medical student?

Participant 12:
I mean I think [umm] for me, the preclinical side, the different instructors who did talk about it, were very passionate about it and very knowledgeable about it. [umm] And they kind of acknowledged to us that most work [*stuttered in speech, repeated dialogue*] in most cases it's not going to be followed correctly because the world isn't [like] a perfect place. [umm] But they did talk about different resources, different ways of addressing patients to discuss pain medication and pain management. And they also gave us resources just [umm] when it comes to weaning off opioids, I guess, as well.

Moderator 9:
Yeah, I would agree that [like] those who came to talk about it, and then it was their focus to talk about, were really passionate, which makes sense because it's kind of a [umm] really important topic and then those who didn't model the behavior, or whatever, it wasn't [*stuttered in speech, repeated dialogue*] it was more just [like] a lapse in knowledge or, I guess, mostly just knowledge or consideration. No one was [like] passionately not prescribing Narcan [like] they just kind of were [like] didn't either realize or [like] never had been taught. [umm] and then some experiences where I felt, I think supported was the question, was [umm] definitely during preclinical years, so we had those harm reduction workshops [like] those were not put on by the school but were put on by a club at the school. [umm] So they were [like] offered to all students for free. And then also we had some [umm] small group discussion [like] our PBL group had just got [*stuttered in speech, repeated dialogue*] it was more about [like] students in medical school living with addiction and what support there was [umm] for those people, or for all of us.

Participant 10:
Yeah, I felt like [*stuttered in speech, repeated dialogue*] I felt supported mostly in, I guess, helping with an overdose. So [like] when they talked about the signs and symptoms [umm] that

we should recognize and then using Narcan, and then actually showing us how to use it and giving [umm] a sample to us. I felt supported in that but I guess more so less supported on the [like] prevention of an overdose in the first place, with more knowledge about the drugs and [like] prescribing them and everything.

Participant 11:
Yeah, I would say I felt most supported at the harm reduction events as well, which again, weren't put on by the school but because that's where I got [umm] my Narcan from and also heard more about the signs and symptoms. I feel like we got that in our class too, but I remember it better from the harm reduction meetings.

Moderator:
That's all really important for me to hear. So thank you all for relaying those experiences. I'm interested in learning about the specialty you all intend to pursue, so if you feel comfortable, please name the specialty and describe how often you anticipate prescribing opioids in your future practice.

Participant 11:
I'm planning on going into PM&R. [umm] So I think it's probably likely [umm] that I will prescribe opioids in the future. [umm] I'm planning on going more into the sports medicine side so that's not really [*stuttered in speech, repeated dialogue*] I don't see it as prevalent as it could be in someone in PM&R. But probably a possibility.

Moderator:
Sorry, I'm not as familiar with the terminology. Could you tell me what PM&R stands for?

Participant 11:
Yeah, it's physical medicine and rehabilitation.

Moderator:
Got it, thank you.

Participant 11:
And they do a lot of pain management.

Participant 10:
I'm going into pediatrics and I feel like I won't be prescribing them a lot. [umm] The only thing I can think of is if I end up going into [like] ICU, [like] in the PICU. I mean, they use a lot of opioids. And then [like] wean them off of them while they're sedated, but I probably won't do that. So probably not likely.

Participant 9:
I'm planning on going into OBGYN [umm] and I think probably some, just as postsurgical pain [umm] for the more GYN cases.

Participant 12:
I'm planning on going into emergency [umm] so probably doing it a fair amount [umm] for immediate treating of patients coming in with pain [umm] and less so prescribing prescriptions for discharge. [umm] And if it is, normally very low doses with the plan to follow-up with a pain specialist or primary care doctor.

Moderator:
So regarding the opioid education you've received thus far in medical school, do you feel prepared to encounter opioids when you enter your residency for your specialty of interest?

Participant 12:
For me, I think with emergency medicine often we'll see overdoses [umm] and I've been an EMT for a few years now and I think that that's probably helped me more than medical school. [umm] Just because medical schools have a harder time putting students directly in those situations [umm] because if something goes wrong, then there's no kind of licenseship or whatever. So I do think that I'll be prepared enough for immediate things. And I think that hopefully when we do our required emergency medicine rotation, I'll feel better for it [umm] for the more advanced management.

Participant 11:
As far as feeling [like] prepared to prescribe opiates or anything like that, I would say I definitely wouldn't be prepared to do it right now because I know nothing about dosages or anything. But I feel confident that it's somewhere in the curriculum that I will be taught before I'm at that point.

Participant 10:
Yeah, definitely don't feel super competent. [*laughter*]

Participant 9:
I think [umm] echoing [**redacted name of Participant 11**]'s [like] question about dosing and that sort of thing, I definitely don't feel confident in that regard. And what makes me [*stuttered in speech, repeated dialogue*] and I think that's kind of par for the course in terms of how I would be confident in prescribing other medications as well. Like I think dosing is something you learn a lot about in residency. But something that worries me, particularly with opioids, is that I think a lot of things are just done because that's how they've been done. And so I worry about [umm] kind of with the stress of residency and seeing a bunch of patients [like] having that energy and competence to question how things are being done and what is the correct way, or maybe a more

responsible way.

Moderator:
Thank you all for sharing that. So, kind of thinking about that as well, are there any hesitations, barriers, or gaps in knowledge that you're concerned about as you think about prescribing opioids in your future careers?

Participant 12:
I think it's just going to be one of those things where, within medicine, you're not supposed to do anything that you don't feel comfortable with. And if you don't feel comfortable with it, you'll find a way [umm] to figure out how the appropriate way is or figure out who to ask to do that. So I do think that, down the road, [umm] I'll build an understanding of it [umm] with the caveat that it's also a field that is [like] rapidly changing. And the standards of care are also changing for opioid administration. So I think that it's something that you'll just have to be kind of [umm] following on up to date and other regulatory paths.

Participant 11:
I would say I definitely feel like I have a gap of knowledge in the differences between types of opioids. I mean, I know fentanyl is really potent and strong in a small dosage. But other than that, [like] the differences between opioid types, I really don't think I could say.

Participant 9:
Something I worry about is just [like] the infrastructure around [umm] prescribing opiates. [like] People living with addiction will [umm] sometimes go to multiple locations and get multiple different prescriptions. I don't think that it's required, but Washington regulated as much as it could be and the flip side of that is some people who are in pain are kind of [umm] pushed aside or thought of as [umm] medication seeking. And so I think that is a challenge, [like] finding the balance between that and making sure you're giving patients the care that they need and deserve versus not [umm] contributing to a problem.

Participant 10:
Actually, I will say too, back to change my previous answers slightly about how often I would be prescribing them. I am thinking back now in my life when I was in hospital, and we sent a few kids home with opioids, [like] one has pretty severe dental extraction, [like] lots of other medical problems and was in the hospital but [umm] and my attending was like, “how many do you want to send them home with?” and I was like, “I have no idea.” [like] I don't, you know, [like] know which one, what dose, [like] how many days is [like] safe that’s okay. [umm] So yeah it definitely, I don't know, I feel like I would need a lot more [umm] education throughout my residency [like] to feel prepared with that.

Participant 9:
I think another thing is [like], depending on where you're practicing with peds, there are a lot of kids with sickle cell who are chronically on opiates that I'm sure you've seen. [umm] But yeah, so that's [like] a whole other thing to manage and try to figure out.

Participant 10:
For sure.

Moderator:
Is there anything anyone else would like to add to that? [*pauses*] So what other factors do you believe influence prescribing of an opioid to a patient? [umm] I know we briefed [*stuttered in speech, repeated dialogue*] or it was briefly mentioned, the medication seeking behaviors, the setting of clinical care, are there any other factors that anyone would like to discuss regarding influencing of prescribing?

Participant 12:
[umm] So I work in an ER not affiliated with my school, and it has residents there. [umm] And one of the residents had a patient with severe pain, crying, whatever, [like] severe, severe pain. And the attending asked the resident, "what would you want if you had this pain?" And she said, "I'd want Dilaudid." And the attending then said, "so what are you going to give her?" and she said, "Tylenol." [umm] And, I think, that it comes down to that people are often afraid to prescribe opiates with the backlash from [umm] both the regulatory, the stigma associated with just giving people pain medications. [umm] So I think that you have to balance the fact that pain management is important and is critical for patients to actually begin to heal. [umm] But also making sure you can figure out ways for the patient to have some sort of [umm] stability and post-discharge care and follow-up socially to make sure that it's not something that they are going to become hooked on. And if they are hooked on it, [umm] treating the pain appropriately, and finding ways to treat the pain, but also working with them on weaning off of it, either inpatient or outpatient.

Participant 9:
I think, kind of like [**redacted name of Participant 12**] was talking about, [like] there's definitely a place for opiates, especially [umm] if you don't adequately control pain when someone has a rib fracture, you can't [*stuttered in speech, repeated dialogue*] [like] they can end up with atelectasis, [like] it's not just [like] pain, it's not just like, "oh darn, that's not fun." [like] It's a real problem. And I think what [**redacted name of Participant 12**] is saying is right, [like] you have to try to figure out does this person have a support system, does this person have this, but then because [umm] of [like] structural racism in this country [like] people are most [like] [*stuttered in speech, repeated dialogue*] more likely to not have a support system than others and then so you're more likely to not prescribe them opiates and then they're more likely to have

complications from [umm] surgery, including [like] a PE if they're not moving enough because they're in so much pain. So it's [like] trying to balance that with [like], again, not contributing to this problem is [like] very difficult.

Moderator:
I want to highlight something that, oh I'm sorry [**redacted name of Participant 11**], go ahead.

Participant 11:
Oh, no, I was just gonna say I think [**redacted name of Participant 9**] said it really well and that I have nothing more to add because that was a great speech.

Participant 9:
Thank you.

Moderator:
Yeah, revisiting that, because it was interesting [like] some of your answers revolved more around [like] influences specific to the provider and then there are also potentially influences specific to the patients, which I'd be interested in discussing further. I know [**redacted name of Participant 9**] referenced structural racism as a component embedded in medicine, unfortunately. [umm] Are there any other patient factors potentially that may alter the way that a provider [*stuttered in speech, repeated dialogue*] if they prescribe them or not, or [like] maybe the type of opioid they prescribe them or dosage or length or anything of that nature?

Participant 12:
I think, with advances in electronic medical records, it's very easy to now see a patient's history [umm] to see [like] if they ever have overdosed. I know in New Jersey you can [*stuttered in speech, repeated dialogue*] any opiate that is distributed, dispensed, it will tell you exactly how many pills they should have left or when they're due for a refill. [umm] So I think that there's a series of boundaries [umm] that providers have to go through to make sure that they can actually prescribe this important medication. [umm] And I think that sometimes that delays patient care and often it's easier to prescribe a higher dose non-opiate than actually go through the work of finding what an appropriate medication to prescribe should be. [umm] So I guess, just in terms other than the structural racism that definitely exists. I think you have to look at just the patient's history. [umm] And are they living with addiction, are they experiencing homelessness, and understand who the patient is and see what kind of follow-up they're gonna get. [umm] Because, again, pain management is important for other functions of life. And if someone's not going to be able to follow-up and you want to make sure that they're not experiencing pain, but also you need to work on how to get them follow-up.

Participant 9:

And then also something that we haven't talked about a whole lot is what patients ask for. So, [umm] especially in Atlanta and across the country, I'm sure but it's just where I am, [like] over the past few years, the fear of fentanyl has increased. [like] People know and people are afraid. And so [like] I was at the trauma center a few months ago and someone had been hit by a car, could barely speak and all he was saying was "don't give me fentanyl," because he had [like] heard about it, [like] had heard someone say it [like] in the ambulance or something. And [like], you know, so it's [*stuttered in speech, repeated dialogue*] and a lot of patient [like], there should be right this [like] shared decision-making between physician and patient, especially when it comes to something with serious side effects and information but I think it's something that, you just have to remember that there's not one person making a decision.

Moderator:
[**redacted name of Participant 11**], [**redacted name of Participant 10**], is there anything that either of you would like to add? [*pauses*] So, yeah, thank you for mentioning that. [umm] So I know we've been kind of talking about [like] the dangers and concerns regarding opioids. So something I was thinking of that I wanted to ask is, is there anything that any of you are maybe hopeful about regarding [like] the future of opioid prescribing, especially going into the medical field in the midst of the opioid epidemic? Is there anything that you feel [like] there's a positivity regarding [like] a change or some kind of movement as you think about your future in medicine?

Participant 10:
I feel like it's, oh, sorry, go ahead.

Participant 11:
I was just gonna say that I'm hopeful for other [umm] ways of managing chronic pain being discovered. I mean, there are [like] now a few options, but it's very limited and it's really hard to treat [like] chronic pain, especially when it's involving the spine and back and it just a lot of patients just come in, and really [*stuttered in speech, repeated dialogue*] there's really not much you can do for them and they are in serious pain. And so, opioids do tend to be the option because they just don't want to live with the pain that they're dealing with and their pain does need to be still managed. So, I'm just hopeful for continued research and hopefully new ways of managing chronic pain.

Participant 10:
Yeah, I guess it's, you know, [like] you have to see the good that comes with the bad so I guess being with this opioid epidemic, it's gonna, you know, prompt more education on it and school and I think more [umm] I don't know, I think that [*stuttered in speech, repeated dialogue*] that will be good. And I felt like when you're trying to prescribe it, it's going to be more, not regulated, just [like] it is, but maybe people will be more inclined to better follow-up about it and [umm] I feel like we'll be very conscious of what we prescribe [like] going into practicing [like]

during this epidemic.

Participant 9:
I guess it's definitely introduced a more healthy skepticism of [like] pharmaco- [*stuttered in speech, repeated dialogue*] pharmacology companies. [like] I know just anecdotally [like] a lot less physicians will let pharm reps into their practices and [umm] just to [like] buy them lunch and stuff. So [umm] I think that, [like] as horrible as this entire epidemic is, I'm hoping that it'll prevent a future one, that we're just more skeptical of incoming medications and kind of really digging into what the research is saying rather than what the salespeople are saying.

Moderator:
Yeah, I really like that phrase of healthy skepticism. I think it's especially on the research side, which is [*stuttered in speech, repeated dialogue*] research is my thing [*laughter*]. So, I like that you brought that up. [**redacted name of Participant 12**] is there anything that you would like to add?

Participant 12:
[umm] I guess I'm hopeful that [umm] we just find more ways of making sure that we're getting people who need pain management the opioids, the pain management that they need. [umm] Because I do worry, [like] I see it all the time, where people are just going home still in pain without [umm] follow-up, without any kind of post-care. [umm] And I just hope that we find ways of maximizing [umm] the accessibility of it in ways that aren't harmful as well, I guess, and I think that's definitely a hard thing. But I guess I'm more worried than optimistic still.

Moderator:
That's very valid. Is there anything else anybody would like to add to that point? [*pauses*] So as we conclude our discussion, what else would anyone like to share? [*pauses*] That's okay if nobody wants to speak up. So, those were my last few questions for our discussion tonight. Once again, I want to thank you all for taking the time to speak with me this evening. Your responses will be very valuable in my learning about your experiences with opioid education during medical school. To express my gratitude for your participation in this discussion, a $10 amazon gift card will be sent to the email address that you've indicated to me previously. So one note about the gift cards, they are in the process of being, I guess, approved by the research PIs. So hopefully you guys will receive it in the next week or so. Regardless, I promise that you will receive your incentive. It's important to me that you guys are compensated for your time. And it's Amazon gift cards, you know, the holiday season is coming up already, you can spend some money! So, I ensure that you will receive them as soon as possible. Also, if you know of anybody that would be interested in participating in a future focus group, please feel free to provide them with my contact information or, if they're comfortable, provide me with theirs. And if you have any questions about the study, please do not hesitate to reach out to me, I'll get back

to you as soon as humanly possible. I definitely enjoy speaking to you all about this, so more for me to learn. So this is going to conclude our focus group for this evening. I'm going to stop the recording right now.