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Increasing the Knowledge of Opioid Use Disorder and Medication Assisted Treatment for Advanced Practice Registered Nurses in Georgia

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Table of Contents

Abstract

The national opioid crisis has had devastating effects on the United States (US) healthcare system with the financial burden totaling more than $2 trillion from 2015 to 2018 (White House Government, 2020) and the physical burden of 128 overdose-related deaths daily (Centers for Disease Control, 2020). According to the Centers for Disease Control (CDC), some of these deaths result from deficits in education of healthcare providers about pain management treatment (CDC, 2020). Improved education for healthcare providers has resulted in a significant decline in the total number of opioid prescriptions from 2016 to 2019, which suggests that successful containment of the opioid epidemic begins with the prescriber (White House Government, 2020). This paper will describe an online training module's effectiveness in educating Advanced Practice Registered Nurses (APRNs) about medications used to treat opioid use disorder (OUD).

Keywords: opioid use disorder, advanced practice registered nurse, training modules, medication-assisted treatment, knowledge assessment

Chapter I

Pain is an unpleasant emotional or physical experience (The American Society of Addiction Medicine [ASAM], 2019). Chronic pain affects over 50 million Americans and is one of the most common reasons patients seek medical care (CDC, n d). Chronic pain is the presence of pain lasting more than three months (ASAM, 2019). An effective treatment modality for chronic pain is the use of opioid narcotics (Dydyk, et al., 2020). In 2012, 259 million opioid prescriptions were written which is equivocal to one bottle of pills per adult in the United States (CDC, n d). Statistics such as these prompted the CDC to name OUD as a national healthcare concern citing sales of opioid pain medications have increased in parallel with opioid-related overdose deaths (CDC, n d).

Opioid use disorder is a multifaceted condition involving biological, environmental, genetic, and psychosocial factors (Dydyk, et al., 2020) and is an overwhelming and uncontrollable craving for opioids despite the adverse effects that occur because of their use (The Department of Health and Human Services [DHHS], n d). A study by the ASAM (2019) reported over ten million Americans admitted to the misuse or overuse of prescription opioids. Dydyk, et al. (2020) reported that 50% of patients currently on chronic opioid pain management also meet *DSM-5* criteria for OUD. A 2018 survey by the National Survey of Drug Use and Health (NSDUH) revealed approximately two million people met criteria consistent with opioid use disorder (OUD) as depicted in the *Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-5)* (NSDUH, 2018). In combination with the addictive qualities of these medications, the excessive number of prescriptions led to federal and state regulations governing the use and distribution of opioid medications (CDC, n d).

While all opioid-related deaths cannot be attributed to the prescriber, those prescribing opioid medications require education on all aspects of chronic pain management in the absence or presence of OUD**.** Treatment for OUD involves a combination of several modalities, including psychosocial and behavioral interventions, but the addition of pharmacological agents has proven to be the most therapeutic (ASAM, 2019). Pharmacological treatment for OUD is known as Medication-Assisted Treatment (MAT). Three medications are approved for MAT: Naloxone, Methadone, and Buprenorphine (Substance Abuse and Mental Health Services Administration [SAMHSA], n d). This project focused on MAT and OUD training for APRNs in Georgia using online training modules.

PICOTT

(P) Population: Board-certified, licensed APRNs in the state of Georgia

(I) Intervention: OUD and MAT Online training module

(C) Comparison: Pre and post-testing of knowledge attainment

(O) Outcome (desired of interest): Increased knowledge evidenced by posttest scores

(T) Time: six months

(T) Types of Study Design: Descriptive correlational study

Problem Statements

Problem statements addressed in this study include: 1) Will an online OUD and MAT training module increase APRN's knowledge of OUD and Medication-Assisted Treatment (MAT)? 2) Will years of experience as an APRN be correlated to current Drug Enforcement Agency (DEA) waiver status? 3) Will an OUD and MAT online training module increase the desire of APRNs' to become DEA-waived? 4) Will an OUD and MAT online training module increase the desire of APRNs only practicing in rural areas to become DEA-waived? 5) Will an

OUD and MAT online training module increase the desire of only Nurse Practitioners (NPs) with primary care/family practice board certification to become DEA-waived? 6) Are APRNs with personal experience with OUD more likely to be DEA-waived than those without? 7) Are APRNs with professional experience with OUD more likely to be DEA-waived than those without? 8) Will APRNs' years of professional experience with OUD be correlated to post module expression of interest in obtaining a DEA-waiver?

Purpose

This Doctor of Nursing Practice (DNP) project aimed to increase knowledge of MAT modalities in treating OUD for APRNs in Georgia. This project utilized pre-and post-testing to evaluate knowledge attainment and retention by APRNs after completing online training modules about OUD and MAT. The primary investigator developed the project in hopes that online training would increase the interest of APRNs in Georgia to obtain a DEA waiver to treat OUD.

Specific Aim or Objective

The primary objective of this study was to determine if an online training module would be effective in preparing APRNs to prescribe pharmacological treatment modalities for patients suffering from OUD.

Background and Significance

While OUD is a global health concern, affecting 35.8 million people worldwide, opioid misuse and overdose developed into a national health crisis in the United States over the last three decades (CDC, n d). The United States accounted for two-thirds of the world's opioid-related overdose deaths in 2018 (WHO, n d). Though the United States makes up only four percent of the world's population, it has 27% of the world's drug overdose mortality rates

(United Nations Office on Drugs and Crime, 2016). Between 2010 and 2018, United States citizens' rate of overdose deaths increased by 120% (WHO, n d). According to a report by Humphreys (2018), citizens of the US consumed more than six times the number of opioids than any other developed country, though the incidence of chronic pain was the same. The CDC (2020) reported in 2018 drug overdose was the number one cause of injury-related deaths in the United States, claiming 128 lives daily.

In addition to the loss of lives, the opioid crisis cost the United States more than $696 billion in 2018, which was equivocal to 3.4 % of the gross domestic product (GDP) and more than $2.5 trillion for the four years from 2015 to 2018 (White House Government, 2020). The highest costs related to the epidemic were associated with healthcare expenses. Other expenditures resulting from OUD were costs related to the criminal justice system and lost workforce productivity (Neville & Foley, 2020). Criminal justice system expenses were related to police protection, legal fees, prison care, and crime-related property loss (Leslie, et al., 2019). Loss of workforce productivity was defined as absenteeism, work impairment, loss of wages of the affected party, family members, and friends (Leslie, et al., 2019). Neville & Foley (2020) conducted a systematic review researching the financial burden associated with the opioid epidemic. Healthcare costs and costs related to premature OUD-related deaths (defined as the loss of potential lifetime earnings) totaled $458 billion (Neville & Foley, 2020). Results of a 2019 study by Siegel, et al. revealed costs associated with the criminal justice system’s involvement totaled $39 billion, while lost workforce productivity was estimated at $96 billion. Additionally, federal agencies responsible for regulating the epidemic accounted for 14% of the financial burden (Neville & Foley, 2020). These agencies include but are not limited to

Medicaid, Medicare, SAMHSA, DEA, and FDA (Neville & Foley, 2020). The fiscal impact of the OUD crisis continues to escalate and be devastating to U.S. healthcare consumers.

Medication-Assisted Treatment

Medication-assisted treatment (MAT) involves the administration of three medications for the treatment of opioid use disorders (OUD) (DEA, n d). It is combined with behavioral therapies to promote abstinence and sustain recovery (FDA, n d). MAT is recognized as the gold standard of care for those suffering from OUD (FDA, n d). According to the FDA, there is no limitation on the duration of treatment, and treatment can be used safely for an indefinite amount of time but requires trained providers to administer (FDA, n d).

There are three designated medications used in the treatment of OUD, and each medication is categorized as a either a full agonist, partial agonist, or an antagonist drug (MEDshadow, n d). Patients seeking treatment for OUD should be offered access to all three medications for optimal effective treatment (FDA, n d). The full agonist medication used in MAT is methadone, a schedule II drug (MEDshadow, n d). Buprenorphine, a schedule III medication, is a partial agonist used for OUD treatment (MEDshadow, n d). Naloxone, an antagonist, is a schedule IV drug (MEDshadow, n d). It is necessary to clarify schedule classifications of the medications used in MAT delivery to understand the significance of the barriers that inhibit its utilization.

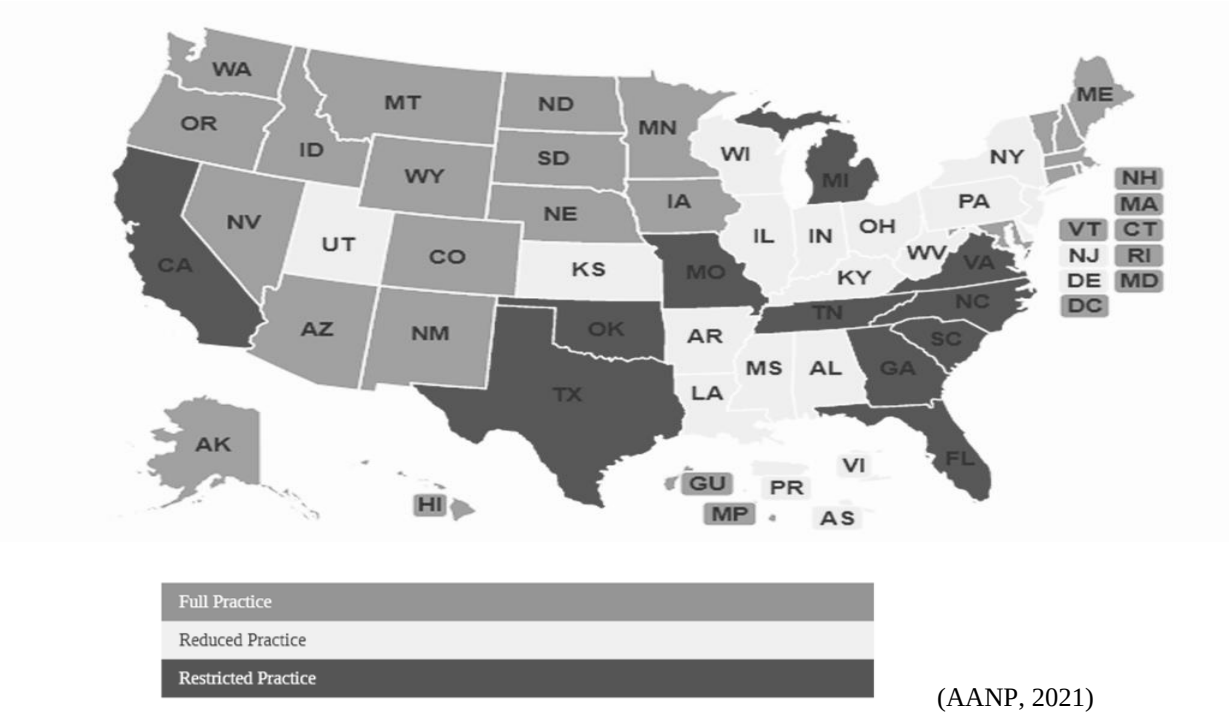
The addition of MAT in the OUD practice guidelines has produced effective management strategies for treating OUD, but successful containment depends on two components: the patient and the provider (Barnett, et al., 2019). The patient must be receptive to treatment and the provider must be authorized, accessible, and adequately trained to deliver the treatment. While

accountability lies with the patient's receptiveness, provider availability deficits are identified as barriers to effective treatment for OUD (Barnett, et al., 2019).

Physicians, APRNs, and Physician Assistants (PAs) can provide effective treatment for OUD but must be authorized by the DEA to prescribe these medications (SAMHSA, n d). Authorization is granted after completing either an eight-hour (for physicians) or 24-hour (for APRNs), MAT-specific training course provided by the DEA (DEA, n d). While physicians have full prescriptive authority regardless of geographic location, APRNs do not. Some states restrict APRNs' prescriptive authority, which is a deterrent for providers in those states to seek DEA waiver status and MAT training. This affects the accessibility to OUD treatment (Barnett et al., 2018). States with limited or restrictive prescriptive authority practices for APRNs are depicted in Figure 1 (American Association of Nurse Practitioners [AANP], 2021). Though practice regulations for providers may vary from state to state, the need for OUD-trained providers remains constant in all states (Barnett, et al., 2019).

Figure 1

The United States NPs Practice Environment -January 2021



(AANP, 2021)

Note. This map lists the level of prescriptive authority by APRNs as January 2021. Full practice allows NPs to prescribe all medications under the state Board of Nursing. Reduced practice reduces the ability of NPs to engage in at least one element of NP practice and requires collaborative agreement with a physicians. Restricted practice restricts the prescriptive power of a nurse practitioner and requires supervision by a physician.

Barriers in Opioid Use Disorder Treatment

Successful containment of the opioid epidemic requires a multifaceted approach that targets identifiable barriers to accessibility and the implementation of evidence-based solutions (Barnett, et al., 2019). Identifying the obstacles that inhibit the provision of quality care is crucial for those suffering from OUD. The most common barriers identified in the treatment of OUD include lack of patient access to care, lack of OUD-trained providers, the limited number of DEA- waived providers, and federal and state regulations of waived providers (Germack, 2021). This paper will review these barriers to provide a conceptual framework for the significance of these barriers' effects on OUD.

Lack of Patient Access to Care

The opioid crisis has gained national attention prompting governmental regulatory agencies to produce a strategic plan to combat this epidemic. In 2015, the United States Department of Health and Human Services (DHHS) recognized the economic effects and created initiatives to control opioid-prescribing practices, the expansion and distribution of naloxone to treat overdose, and accessibility to MAT for OUD (DHHS, n d). The Agency for Healthcare Research and Quality (AHRQ) also developed initiatives that focused on access to care (AHRQ, n d). The initiatives included conducting an environmental scan on implementation of MAT in rural primary care practices, identifying tools needed for MAT implementation, partnering with technical assistance to disseminate the findings, and sharing resources with others implementing MAT for OUD in rural primary care settings (AHRQ, n d).

Policymakers and governmental regulatory agencies emphasized MAT accessibility by passing legislation to allow DEA-waived, trained, office-based primary care providers to treat OUD instead of addiction facilities only (Cole, et al., 2019). While this contributed to an increase in the number of DEA-waived providers overall, rural communities still lack access to those providers. According to Cole, et al. (2019), as of 2011, 60% of small, non-metropolitan communities had limited or no access to opioid treatment (Cole, et al., 2019). A retrospective study focused on a rural community of Medicaid enrollees with OUD in Pennsylvania and revealed 18% of patients were diagnosed with OUD by a primary provider. Only 50% received MAT treatment (Cole, et al., 2019). Of those who received MAT, 67% were treated for OUD by their primary care provider (Cole, et al.,2019). Participants in this study cited several barriers to seeking treatment for OUD, but the most significant barrier identified was the distance to treatment options (Cole, et al., 2019). The median distance traveled to a non-primary MAT

prescriber was 48.8 miles, compared to a median of 4.2 miles to a primary care MAT provider. Those who traveled farther than 45 miles for OUD treatment were 70% less likely to receive continuity of pharmacological management ($p = 0.007$) (Cole, et al., 2019).

Barnett, et al. (2019) also reported significant barriers to accessibility of care in rural areas. This study examined the total number of providers (physicians, APRNs, and PAs) in urban and rural counties in the United States compared to those who were DEA-waived to treat OUD pharmacologically. As of 2017, 56% of rural counties in the United States had DEA-waived providers but were not accepting new patients or were at regulatory treatment capacity (Barnett, et al., 2019). Additional barriers cited the decreasing number of practicing physicians in rural committees promoting an increase in the number of APRNs replacing them (Barnett, et al., 2019). Though APRNs are qualified to provide care comparative to physicians, many federal and state regulations inhibit APRNs' scope of practice without a collaborative practice agreement (Barnett, et al., 2018). Efforts to control the OUD epidemic depend on the availability of treatment. Federal and state regulations are significant barriers to increasing the access and availability to care for those suffering from OUD.

Federal Regulations

Over the last two decades, legislation focused on healthcare reform has targeted the opioid epidemic. The Drug Addiction Treatment Act (DATA) of 2000 allowed physicians to complete an eight-hour training module to obtain a waiver from the DEA to prescribe buprenorphine to treat OUD (Andrilla, et al., 2020). The goal was to increase accessibility for patients seeking OUD treatment in areas where community resources were limited (Andrilla, et al., 2020). This initiative had limited success because of treatment restrictions posed on DEA-

waivered physicians. They were only allowed to treat 30 patients concurrently for the first year after obtaining the waiver (Andrilla, et al., 2020).

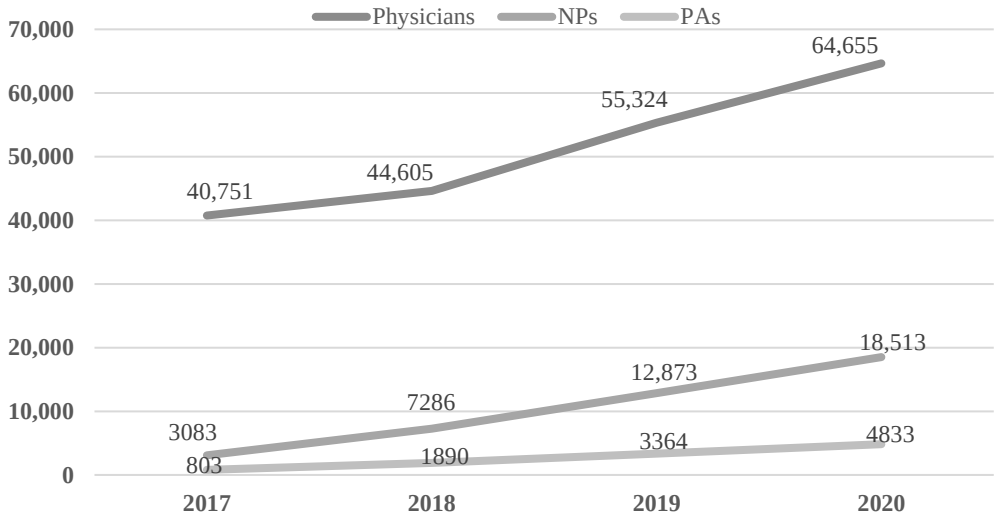
In 2016, without seeing a significant improvement in the decline of opioid effects, the United States Congress passed the Comprehensive Addiction and Recovery Act (CARA) that allowed NPs and PAs to obtain a DEA waiver to prescribe buprenorphine for 30 patients concurrently with the ability to increase to 100 patients together after the first year (Andrilla, et al., 2020). A noticeable decline in the number of opioid prescriptions written from 2016 to 2019 was attributed to the number of DEA-waivered providers treating OUD in urban and rural areas (White House Government, 2020). Though CARA increased the number of DEA-waived providers, limitations in accessibility to care still existed in rural regions. In a 2018 study by Andrilla, et al., 43.8% of DEA-waived providers were not accepting new OUD patients for MAT (Andrilla, et al., 2018). To increase accessibility, federal legislation increased the physician treatment limitation from 100 patients to 275 concurrently after the first year (DEA, n d). Despite the passing of this legislation, there were still many patients without a MAT, DEA-waived provider (Barnett, et al., 2019).

In 2018, the Substance Use-Disorder Prevention that Promotes Opioid Recovery and Treatment (SUPPORT) Act passed to address treatment, prevention, and recovery for patients and communities suffering from addiction (Andrilla, et al., 2020). The SUPPORT Act aimed to improve access to care for those with OUD by removing barriers that inhibit APRNs' prescriptive authority scope of practice (Andrilla, et al., 2020). While CARA allowed NPs and PAs to obtain a DEA waiver to treat OUD, the SUPPORT Act extended this allowance to include Clinical Nurse Specialists (CNS), Certified Registered Nurse Anesthetists (CRNA), and Certified Nurse Midwives (CNW) (Andrilla, et al., 2020). This federal act authorized all APRNs

the ability to treat OUD contingent upon completion of the required 24 hours of DEA training (Andrilla, et al., 2020). As of 2018, 5.7% of physicians and 3.17% NPs were DEA-waived in the United States (Spetz, et al., 2019). This number increased by 111% from 2016 to 2019 because of the previously discussed federal legislative acts (Barnett, et al., 2019). The total number of waived providers in the United States increased from 2017 to 2020. While physician numbers only increased by 37%, NPs and PAs numbers increased substantially by 83% (DEA, n d). Figure 2 illustrates the total numbers of physicians, NPs, and PAs with DEA waivers for 2017-2020. Data used in Figure 2 was extracted from the DEA website using the Diversion Control Division database (DEA, n d). More than half of the increase in DEA-waived providers were NPs and PAs (Barnett, et al., 2019). According to Huhn & Dunn (2017), the number of physicians with a DEA waiver remains low, and those who are waived do not use the waiver to its total capacity (Huhn & Dunn, 2017). According to Andrilla, et al. (2019), the average waived provider, regardless of discipline, does not treat to the max legal capacity (Andrilla, et al., 2019). Despite measures to increase the number of DEA-waivered MAT providers, many rural communities in the U.S. continue to suffer from accessibility issues due to the absence of trained providers (Andrilla, et al., 2019).

Figure 2

Number of DEA-Waived Practitioners in the US 2017-2020[a]



Note. [a]Physician number totals for all years = DEA waiver (DW) for 30, 100, and 275 patients. NPs and PAs number totals for 2017 = DW for 30 patients per the DEA regulations. NPs and PAs number totals for 2018 = DW for 30 and 100 patients DEA regulations. NPs and PAs number totals for 2019 & 2020 = DW for 30, 100, and 275 patients.

State Regulations of Providers

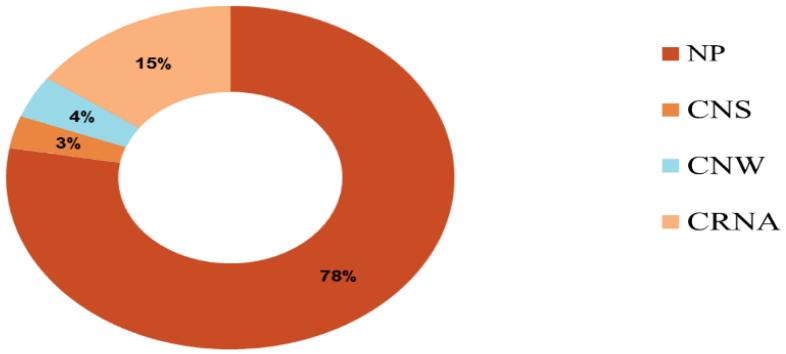
Germack (2021) reported there are 320,000 APRNs with National Provider Identifiers (NPI) in the United States, and 90% of these APRNs are certified as NPs. According to the AANP (2021), up to 75% of these APRNs work in primary care practices, with a percent working as certified psychiatric mental health NPs (Barnes, et al., 2016). Germack (2021) projected that if all states with restrictive prescriptive authority were allowed full authority for APRNs, there would be an expected 37% increase in the number of DEA-waived providers. Currently, 33 states are considered restrictive prescriptive authority states, with Georgia being one of these (Andrilla, et al., 2020).

There are 12,514 APRNs in the state of Georgia (Varghese, et.al, 2019). NPs account for 78% of these and are often serving in rural communities (Figure 3). In 2010, the state of Georgia

passed O.C.G.A. 43-34-25 code which allowed all APRNs to obtain prescriptive authority under a protocol agreement with a delegating physician (Georgia Composite Medical Board [GCMB], n d). This legislation allowed for more practice autonomy for APRNs and outlined authorization for APRNs to obtain a DEA number and prescribe Schedule III, IV, and V drugs as classified by the Federal Drug Administration (FDA) (Justia, n d). Though the passing of O.C.G.A. 43-34-25 in Georgia has allowed for prescriptive authority, the authorization is considered a limited prescriptive authority excluding Schedule II medications (GCMB, n d). Methadone is a Schedule II MAT drug, while buprenorphine is a schedule III MAT drug widely prescribed for patients with OUD (SAMHSA, n d). Because it is classified as a Schedule III drug, buprenorphine can be prescribed by an authorized APRN with a DEA buprenorphine waiver (DEA, n d).

Figure 3

Percentage of Board Certifications of APRNs in the State of Georgia



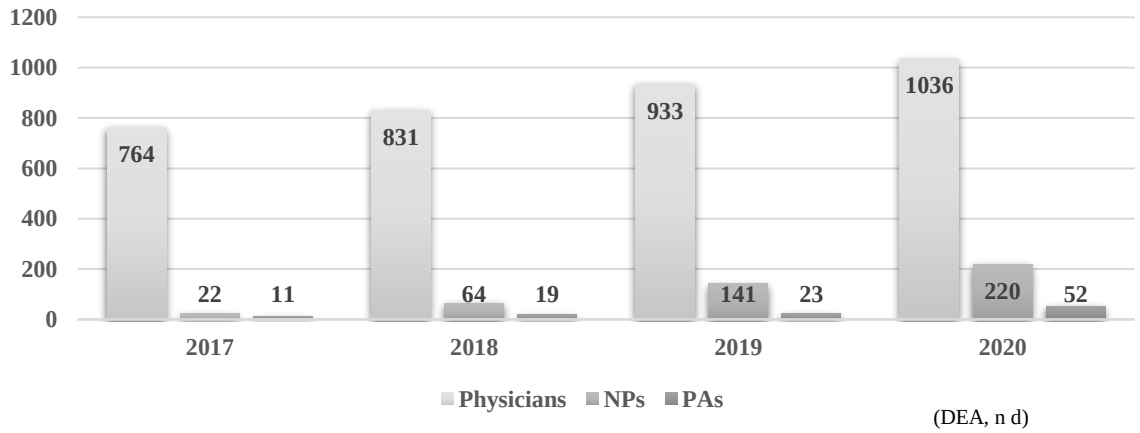
Note. NP-Nurse Practitioner, CNS-Clinical Nurse Specialist, CNW-Certified Midwife, CRNA-Certified Registered Nurse Anesthetist.

The passing of Georgia's law O.C.G.A. 43-34-25 allowed APRNs to bridge the gap in access to care. Still, research reveals few providers are trained to prescribe the approved medical therapy needed for OUD recovery (DEA, n d). The number of qualifying practitioners in Georgia

is listed in Figure 4. Data for this graph was extracted from the DEA website using the Diversion Control Division database (DEA, n d). From 2017-2020, DEA-waivered physicians in Georgia only increased by 272 providers (26%), but DEA-waivered APRNs increased by 90%. Of the authorized APRNs in Georgia, only 11% are MAT-trained with a DEA buprenorphine waiver (Varghese, et al., 2019). Of those who have a waiver, 23% treat patients in the rural, underserved communities and are limited to the number of patients they can treat concurrently (Varghese, et al., 2019). These restrictions contribute to the availability of access to care. Breaking the cycle that affects accessibility requires more MAT-trained, DEA-waivered providers in the practice setting willing to provide quality health care for the OUD population.

Figure 4

Number of Waived Providers in Georgia 2017-2020



(DEA, n d)

Note. Physician number totals for all years = DEA waiver (DW) for 30, 100, and 275 patients.

NPs and PAs number totals for 2017 = DW for 30 patients per the DEA regulations. NPs and PAs number totals for 2018 = DW for 30 and 100 patients DEA regulations. NPs and PAs number totals for 2019 & 2020 = DW for 30, 100, and 275 patients.

In February 2021, Georgia House Bill (HB) 369 was presented to the House of Representatives legislative floor. HB 369 authorized physicians to delegate authority to APRNs to prescribe Schedule II controlled substances under certain conditions. If HB 369 had passed, it

would have been a significant breakthrough for practicing APRNs in Georgia. In addition to the provision of APRNs practice capability, HB 369 would have increased access to care for chronic pain patients and those who need Methadone for OUD treatment (Legiscan, 2021). On March 5, 2021, HB 369 passed the House of Representatives with a vote of 149-12-10-14 and then was moved to the Senate floor (Legiscan, 2021). The bill was tabled on the Georgia Senate floor, not to be considered until the next legislative session. Though this was a setback for APRNs' practice autonomy in Georgia, it should not deter APRNs from seeking DEA-waiver authorization.

Lack of OUD Trained Providers

According to the CDC (2020), lack of proper education for providers and patients regarding pain management accounted for some opioid overdose deaths. Results of a study by Costello & Thompson (2015) revealed a pain management knowledge gap among providers who prescribed opioid drugs for pain control. This gap included patient assessment, types of pharmacologic management, use of adjuvant medications, assessment of risks of addiction, risks of respiratory depression, and appropriate disposal and storage of opioid analgesics (Costello & Thompson, 2015). In another study by Costello, et al. (2016), providers were asked to complete a pre-test about their knowledge of opioid safety, attend a one-hour opioid safety seminar, and take a post-test to assess retainment of content. They were then asked to use this information to teach patients about opioid medication safety before discharge. The provider and the patient were contacted one week after patient discharge to assess recall of the opioid safety instructions provided. There was a statistically significant increase in opioid safety knowledge ($p = 0.000$) for both patients and providers (Costello, et al., 2016). These results suggest that patients'

understanding of medication safety improves when providers are knowledgeable about the medication (Costello, et al., 2016).

While MAT treatment for OUD is effective, research shows that 80% of those with OUD do not receive MAT treatment (SAMHSA, n d). Germack (2021) cites many factors as causes for the lack of treatment. These include provider time constraints, reimbursement issues, stigma, lack of access to care, and lack of trained providers (Germack, 2021). A study by Tesema, et al. (2018) surveyed medical residency programs in the United States to examine the presence of addiction medicine curriculum content (Tesema, et al., 2018). Residency programs participating in this study included internal medicine, primary care, and psychiatric medicine. Of the 476 programs, 76.9% reported managing OUD patients, but only 23.5% dedicated more than 12 didactic hours to addiction medicine, while only 35.9% encouraged OUD training (Tesema, et al., 2018). Despite these results, 88% of the responding program directors admitted that pharmacological modalities are essential in OUD treatment, and 73.7% believed that increased OUD training in residency could increase accessibility to care (Tesema, et al., 2018).

Kameg, et al. (2018) introduced a course into a graduate nursing school curriculum that provided a comprehensive approach to treating substance abuse using evidence-based practice modalities emphasizing MAT as part of its pharmacological requirements. This program was implemented at the University of Pittsburgh School of Nursing, and the participants were students enrolled in graduate nursing programs including NP, CMW, CRNA, and CNS tracks (Kameg, et al., 2018). A five-question test was administered to 218 students before exposure to didactic and online MAT training modules and again after completing the modules (Kameg, et al., 2018). Knowledge assessment increased significantly from pre-test to post-test ($p < .01$) with the completion of the didactic and online MAT module content (Kameg, et al., 2018). Students

also provided feedback expressing interest in working with OUD patients and reported an increase in self-efficacy in using MAT after completing the study (Kameg, et al., 2018).

Despite the proven effectiveness of MAT in the treatment of OUD, MAT is underutilized (CDC, n d). Iheanacho, et al. (2020) examined community mental health care providers who reported reluctance to use MAT in their practice. These providers cited low confidence about OUD and addictive conditions. They also reported reluctancy in managing patients with OUD (Iheanacho, et al., 2020). The researchers introduced a one-day MAT training for 107 community-based mental health providers after completing a 30-item pre-training questionnaire. A separate 30-item questionnaire was administered post training (Iheanacho, et al., 2020). A factor analysis was performed on two factors identified in the questionnaire. These two factors included a readiness by providers to address addiction use disorder with patients and the provider's understanding of abuse disorders as a disease process (Iheanacho, et al., 2020). Results revealed a significant change in both factors, $p = 0.0001$ and $p = 0.0003$ respectively. These results suggest that extensive or brief training can increase clinicians' comprehension and comfort level in treating addictive diseases (Iheanacho, et al., 2020).

Despite multiple federal initiatives and policies instituted over the years, the opioid battle has made little progress (Compton & Blacher, 2020). Efforts to increase the number of waived providers through face-to-face didactic training have not been the solution to educating providers about OUD. Compton & Blacher (2020) suggest that using of didactic teaching alone for OUD was inadequate because it did not allow the provider to address patient safety simultaneously. A study by Compton & Blacher in 2020 researched providers' perceived preparedness to treat OUD after completing a simulation experience. In this qualitative study, APRN students attended a required didactic class on OUD, completed eight hours of DEA buprenorphine online training,

and participated in a simulation experience focusing on OUD assessment and MAT induction. The APRN students reported increased self-efficacy, a greater understanding of OUD, and improved communication skills because of the added simulation experience (Compton & Blacher, 2020).

The reluctancy to treat OUD patients is apparent across all levels of providers, despite education or discipline. Federal regulations and training modules equip the provider to address the needs of the OUD community but have not produced a substantial impact on opioid treatment as initially envisioned. The development of the Providers' Clinical Support System for Medication Assisted Treatment (PCSS-MAT) initiative aimed to provide mentorship and continuing education opportunities for health care professionals in the treatment of OUD (Levin, et al., 2016). The American Academy of Addiction Psychiatry (AAAP) championed the development of the PCSS-MAT (Levin, et al., 2016). The program offered support to clinicians by providing evidence-based practice modalities in the treatment of OUD. The introduction of PCSS-MAT made treating OUD a public health priority by focusing on increasing accessibility and utilization of MAT in community-based facilities (Levin, et al., 2016).

The nursing profession is the largest group of healthcare providers in the United States, which positions them to be a powerful player in addressing the opioid crisis (Compton & Blacher, 2020). APRNs are essential resources for treating prescription opioid diversion and abuse (Manworren & Gilson, 2015). APRNs often practice in the underserved, rural regions and are positioned to provide comprehensive quality care for those suffering from OUD. APRNs can address the barriers that affect healthcare accessibility concerns thus, providing the appropriate training for APRNs is crucial for successful containment of OUD locally and nationally.

Theoretical Framework

Hildegard Peplau's Interpersonal Relations Theory

The Interpersonal Relations Theory developed by Hildegard Peplau focuses on the importance of the provider-patient relationship (Nursing Theory, n d). Peplau's theory focuses on the provider-patient relationship. It supports the premise that when the APRN and patient have an established relationship based on trust, the APRN provides quality care, thus motivating the patient to change behaviors due to the established relationship. There are three phases described in the Interpersonal Relations Theory. These phases are the orientation, working, and termination phases and are depicted in Figure 5 (Nursing Theory, n d). In the orientation phase, the provider establishes a relationship with the patient based on the expressed needs and ability of the APRN to meet those needs (Nursing Theory, n d). This phase involves the APRN's understanding of the disease process of OUD and their desire to be proficient in caring for patients with OUD (Nursing Theory, n d).

As the relationship continues, the working phase develops. This phase concentrates on the treatment needs of the patient. The provider encourages the patient to be an active participant in the treatment plan of care (Nursing Theory, n d). Appropriate training in the treatment modalities will prepare the APRN to be proficient in the treatment of OUD. The training module discussed in this study will provide the APRN with sufficient knowledge to guide the patients' treatment.

During the termination phase, the provider leads the patient through the care plan and helps establish new normalcy (Nursing Theory, n d). This phase describes the APRN's role in the treatment process by prescribing MAT to support the patient's recovery and establish a better self-management care model.

Figure 5

Peplau's Interpersonal Relations Theory

(Nursing Theory, n d)

Chapter II

Review of Literature

Methods

Search for Evidence

A systematic review of literature in the English language was conducted for peer-reviewed publications between 2015-2021 and utilized databases of CINAHL, Medline, Cochrane's database, PsycArticles, PubMed, ProQuest, and GCSU Knowledge Box.

Inclusion and Exclusion Criteria

Initial search terms used for this review included "opioid use disorder" and terms such as "opioid addiction" and "substance abuse disorder," in addition to "medication-assisted treatment" and like terms "MAT" and "medication-assisted treatment for opioid addiction". These terms in combination with "advanced practice registered nurses" and "knowledge assessment, education, or understanding awareness" were included in the search criteria. The initial search produced 35,958 articles. Additional search terms added to the initial inquiry

included “systematic review/meta-analysis” and “online training or e-training” and yielded 12,380 articles. Exclusion search terms of “pharmacists,” “chronic pain management or long-term opioid pain management,” and “narcotic pain control” were added to the criteria resulting in 758 articles from CINAHL, Medline, Cochrane’s database, PsycArticles, and PubMed databases. Searches with the same inclusion and exclusion criteria yielded no results in ProQuest or GCSU Knowledge Box databases. After excluding duplicate or irrelevant publications, the investigation resulted in 200 articles pertinent to the study aim. After a critical appraisal of the remaining studies, 19 articles were selected for this literature review. A database PRISMA table is listed in Table 1, and a PRISMA flow diagram is listed in Figure 6, describing search inclusion and exclusion criteria. A literature review with evaluation of evidence is listed in Table 2.

Table 1

Database PRISMA Table

Date	Database	Search terms and connectors	Initial yield	Files Removed	Final Yield
2015-21	CINHAL/PubMed	English AND Peer-Reviewed AND OUD AND MAT AND APRNs AND Knowledge Assessment AND Systematic Review NOT Pharmacist NOT chronic pain management	165	Removal of those that were about pain management or chronic pain management, rehabilitation, diverse	10
4132015-21	MEDLINE	English AND Peer-Reviewed AND OUD AND MAT AND APRNs AND Knowledge Assessment AND Systematic Review NOT Pharmacist NOT chronic pain management	26	Removed for outside US studies, articles, articles about pain control, or duplicates	5
2015-21	APA PsycArticles	English AND Peer-Reviewed AND OUD AND MAT AND APRNs AND Knowledge Assessment AND Systematic Review NOT Pharmacist NOT chronic pain management	9	Removal of those which were not related to addiction or related to alcohol or tobacco use	4

2015-21	Cochrane database of systematic reviews	English AND Peer-Reviewed AND OUD AND MAT AND APRNs AND Knowledge Assessment AND Systematic Review NOT Pharmacist NOT chronic pain management	13	All of these were unrelated to drug addiction	0
2015-21	ProQuest	English AND Peer-Reviewed AND OUD AND MAT AND APRNs AND Knowledge Assessment AND Systematic Review NOT Pharmacist NOT chronic pain management	0	No results	0
2015-21	Knowledge Box GCSU	English AND Peer-Reviewed AND OUD AND MAT AND APRNs AND Knowledge Assessment AND Systematic Review NOT Pharmacist NOT chronic pain management	0	No results	0

Figure 6

Database PRISMA Flow Design

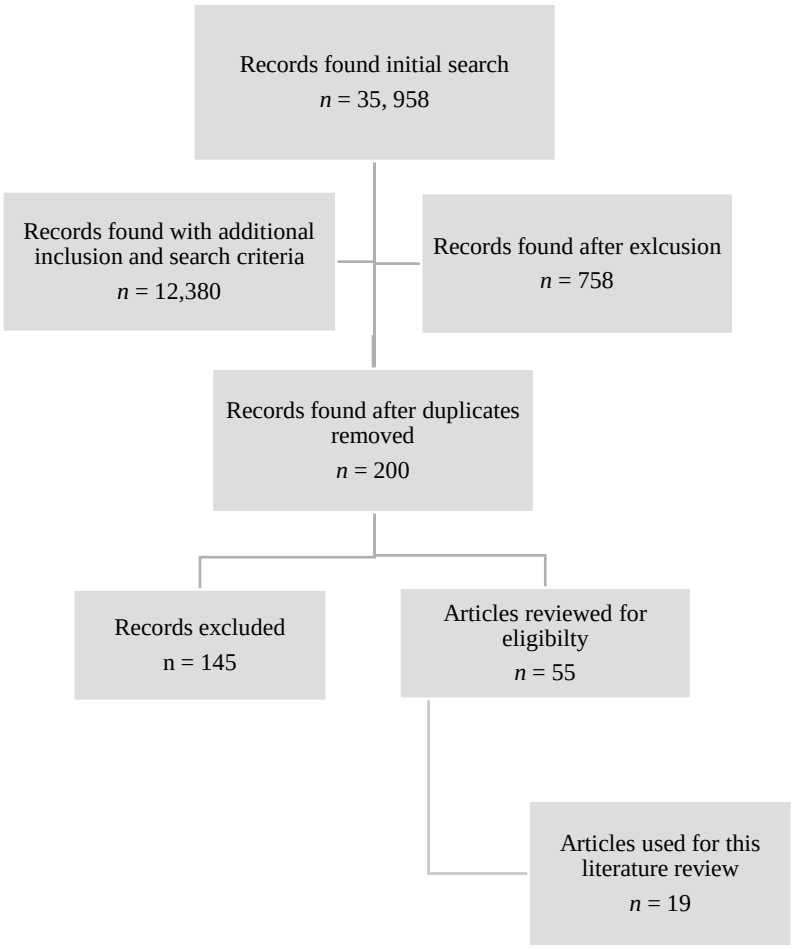


Table 2

Evaluation of Evidence

Authors	Purpose	Conceptual Framework	Design/ Method	Sample/ Setting	Variables/ Definition	Measures	Data Analysis	Findings	Worth to Practice
Abram, M. et al. Clin Sim Nur *2020; 44:35-41.*	Effect of Simulation	Patient safety	QUAL SRS	12 PMHP students NYC SON	IV1: Didactic IV2: Simulation DV: Self-Efficacy DV: Patient safety	SRS	OE	Inc. self-efficacy patient safety	Simulation is effective
Andraka-Christou, B. With Mat: Jrn Law-Med *2016; 26:309-362.*	Rural DEA waived providers	Access to Care	RD	9,346 rural DEAW providers	Providers Patients Regions	CR	Frequencies		
Andrilla, C. et al. Jrnl of Rural Hlth *2019; 35: 108-12.*	Review of DEAW providers	Access to Care	RD		Regions DEAW Providers	CR	Frequencies	56.3% of rural counties are without access to MAT provider	Need for rural DEAW providers
Andrilla, C. et al. Med Care Res and Rev *2020; 77: 208-216.*	Projected MAT access	Access to Care	PD	73,922 Rural US Providers	DEAW Midlevel Providers	CR	Frequencies	Access to care increased by 17%	Increased SOP will increase access to care
Barnett, M. & Frank, R. Hlth Affairs *2019; 38, 1-17.*	Rural DEAW providers	APRN Scope Practice	RD	12,706 Midlevel Providers	DEAW providers Regions		LRA	CARA increased the number DEAW midlevel providers	Scope of practice restrictions affect provider access
Cardarelli, R. et al Jrnl Inter Care *2018; 32:56-565.*	Educate Providers	IDT Collaboration	QUEX PPT	949 IDT providers KY/WV	IV1: Live IV2: Webcasts IV3: Table DV: PPT DV: CON	KASPR		Inc. KN ($p < .001$) live events but change in CON	Inc. KN but not CON
Compton, P. & Blacher,S. Pain Manage Nurs *2020; 21: 35-42.*	OUD Education	Nursing Education	SR					Nurses lack OUD KN	Need for OUD training nursing education

Table 2

Evaluation of Evidence

Authors	Purpose	Conceptual Framework	Design/ Method	Sample/ Setting	Variables/ Definition	Measures	Data Analysis	Findings	Worth to Practice
Costello,M. et al. MEDSURG Nurs *2016; 25: 307-11.*	Inc. Kn.	Patient Safety	QUEX PPT	53 nurses 193 patients Surgical Unit	IV: Opioid Education DV: Nurses' Test Scores DV: Patients' Report	Researcher Developed Test	Chi-square	Inc. KN $p = .000$	Education increases knowledge and patient safety
Iheanacho, T. et al. Comm Mental Hlth Jrnl *2020; 56: 1429-1435.*	Clinician Confidence	Provider Education	QUAL SRS	107 clinicians	IV: MAT training DV: Readiness DV: Understanding	SRS	Factor analysis	Inc. Readiness ($p = .0001$) & Understanding ($p = .0003$)	Training is effective
Kameg, B. et al. Jrnl of Add in Nurs *2018; 29: 163-66.*	Educate APRNs	OUD in nursing education	QUEX PPT	218 APRN students	IV1: Didactic IV2: Online DV: Test Scores	PPT		Inc. KN $p < 0.1$	Training is effective
Lagisetty, et al PLoS ONE *2017; 12: 1-40.*	OUD IDT Care	EBP interventions	SR	35 articles				Inc. access to MAT with IDT collaboration	IDT collaboration is effective
Manworren, R. & Gilson, A. Amer Jrnl Nurs *2015; 115: 34-40.*	Educate Nurses on Opioids	Opioid Diversion	ED						
Moore. K. et al. Jrnl of Sub Abuse Tmnt *2019; 99: 32-43.*	MAT In Prisons	MAT Treatment Effectiveness	SR	24 articles				MAT is effective for OUD treatment	
Neville, K. & Foley, M. Nurs Econ *2020; 38: 7-51.*	Economic burden OUD	Economic Impact	SR	52 articles				Lack of DEAW providers	Need for DEAW providers

Table 2

Evaluation of Evidence

Authors	Purpose	Conceptual Framework	Design/ Method	Sample/ Setting	Variables/ Definition	Measures	Data Analysis	Findings	Worth to Practice
Spetz, J. et al. JAMA *2019; 321: 1407-08.*	State Restrictions	Access to Care	RD	54,109 providers	Provider Type Numbers State Regulations	Case Reviews	Pearson's correlation *t*-tests LRA	MD for NPs with DEAWs was = 3.14 ($p < .001$) between more and less restrictive states	Provider Restrictions affect access to care
Tesema, L. et al. Subs Abuse *2018; 39: 434-440.*	MAT Utilization	OUD Provider Training	QUAL SRS	1029 Resident programs United States		SRS	Chi-square	23.5% >12 hours curricular time to OUD	Access to care is limited by barriers ofproviders
Tierney, M. et al Subs Abuse *2015; 36:389-92*	Increase DEAW APRNs	Access to Care	ED						

Note. QUAL-Qualitative. SRS- Self-report Survey. PMHP- Psychiatric Mental Health Practitioner. IN.- Increased. IV- Independent Variable. DV-Dependent Variable. OE- Observer Evaluation. Inc.-Increased. DEA-Drug Enforcement Agency. RD- Retrospective Descriptive. PD-Prospective Descriptive. LRA- Logistic Regression Analysis. CARA- Comprehensive Addiction and Recovery Act. IDT- Interdisciplinary Team. QUEX- Quasi-Experimental. PPT- Pre and Post Test. CON- Confidence. KN- Knowledge. LOA- Lack of Access. PCP- Primary Care Provider. SR- Systematic Review.
ED- Editorial.

Results

Participants and Sample Size

The participants in the reviewed articles included providers, specifically physicians, APRNs, PAs, graduate nursing students, and mental health clinicians. Various articles studied medical residency programs, patients with OUD, and outpatient clinics. Sample sizes varied, ranging from 12 to 59,000. The studies with larger sample sizes were retrospective, descriptive studies and focused on the number of providers geographically or patients enrolled in Medicaid services. Of the articles reviewed, ten focused on training providers in OUD treatment, nine targeted barriers to OUD treatment, eight focused on federal regulations for DEA waivers for MAT implementation, two discussed state mitigation legal issues, and one focused on financial ramifications of the OUD epidemic. The remaining articles were supportive articles or editorials that provided background information about the effects of the opioid epidemic. The settings for these studies varied but were all located within the United States. Table 3 describes the synthesis of interventions in the articles reviewed for this project.

Appraisal of Evidence

Quality of Articles

The articles selected contained four systematic reviews with Level II or III data, six descriptive studies of Level III, and four Level III quasi-experimental studies. The additional five studies were identified as Level III qualitative or Level IV studies. A description of each study's level of evidence is listed in Table 4.

Table 3

Interventions Synthesis

Authors	Year	Design Study	Population	Sample Size	Outcomes
Abram, et al	2020	Qualitative	PMHP students	12	Improved self-efficacy
Andraka-Christou, et al	2016	Retrospective Descriptive	Rural Providers	59,346	DEAW providers are limited in rural communities
Andrilla, et al	2019	Retrospective Descriptive	US Regions/Providers		Lack of DEAW providers
Andrilla, et al	2020	Retrospective Descriptive	U.S. Providers	73,922	More providers increase access to care
Barnett, et al	2019	Retrospective Descriptive	Midlevel Providers	12.706	Scope of practice limits access to care
Cardarelli, et al	2018	Quasi-experimental Case Control	IDT professionals	949	increased knowledge no change in confidence
Cole, et al	2019	Descriptive Quantitative	Medicaid with OUD in Pennsylvania	7930	Rural OUD Medicaid enrollees seek treatment from PCPs
Compton & Blacher	2020	Systematic Review			Nurses need opioid education in curriculum
Costello, et al	2015	Quasi-experimental	Nurses	133	Nurses lack opioid education
Costello & Thompson	2016	Quasi-experimental	Nurses/Patients	53/193	Increased Nurse and patient knowledge
Iheanacho, et al	2020	Quasi-Experimental	Clinicians	107	Training increased readiness & understanding of MAT
Kameg, et al	2018	Quasi-Experimental	APRN students	218	Increased Knowledge post module, $t\,(217)\ p < 0.1$
Lagisetty,et al	2017	Systematic Review	Articles	35	Multidisciplinary collaboration is effective in treatment
Manworren & Gilson	2015	Editorial			
Moore, et al	2019	Systematic Review	Articles	24	MAT is effective for OUD
Neville & Foley	2020	Systematic Review	Articles	52	Lack of access is dependent on trained providers
Spetz, et al	2019	Retrospective Descriptive	U.S. DEAW providers	54,109	State provider restrictions affect access to care
Tesema, et al	2018	Correlational Descriptive	U.S. Residency Programs	1029	Access to care is limited by provider barriers
Tierney, et al	2015	Expert Opinion			

Table 4

Level of Evidence

Authors	Abram, et al	Andraka-Christou, et al	Andrilla, et al	Andrilla, et al	Barnett & Frank	Cadarelli, et al	Cole, et al
Year	2020	2016	2019	2020	2019	2018	2019
Design Study							
Randomized Clinical Trial							
Non-Randomized Clinical Trial							
Systematic Review							
Quasi-Experimental						X	
Qualitative	X						
Cohort Study							X
Descriptive		X	X	X	X		
Editorial							
Level of Evidence	VI	VI	VI	VI	VI	IV	IV
Independent Variable							
Pretest							
Posttest							
Training Module							
Didactic Lecture	X						
Webcasts						X	
Roundtable						X	
Conferences						X	
Simulation	X						
Dependent Variable							
Self-Efficacy	X						
Patient Safety	X						
Communication	X						
Pretest						X	
Posttest						X	
Readiness							
Knowledge							

Table 4

Level of Evidence

Authors	Compton & Blacher	Costello & Thompson	Costello, et al	Iheanacho, et al	Kameg, et al	Lagisetty, et al	Manworren & Gilson
Year	2020	2015	2016	2020	2018	2017	2015
Design Study							
Randomized Clinical Trial							
Non-Randomized Clinical Trial							
Systematic Review	X					X	
Quasi-Experimental		X	X		X		
Qualitative				X			
Cohort Study							
Descriptive							
Editorial							X
Level of Evidence	V	III	III	VI	III	V	VII
Independent Variable							
Pretest			X				
Posttest			X				
Training Module				X	X		
Didactic Lecture					X		
Webcasts							
Roundtable							
Conferences							
Simulation							
Dependent Variable							
Self-Efficacy							
Patient Safety							
Communication							
Pretest			X		X		
Posttest	X		X		X		
Readiness				X			
Knowledge				X			

Table 4

Level of Evidence

Authors	Moore, et al	Neville & Foley	Spetz, et al	Tesema, et al	Tierney, et al
Year	2019	2020	2019	2018	2015
Design Study					
Randomized Clinical Trial					
Non-Randomized Clinical Trial					
Systematic Review	X	X			
Quasi-Experimental					
Qualitative				X	
Cohort Study					
Descriptive			X		
Editorial					X
Level of Evidence	V	V	VI	VI	VII
Independent Variable					
Pretest					
Posttest					
Training Module					
Didactic Lecture					
Webcasts					
Roundtable					
Conferences					
Simulation					
Dependent Variable					
Self-Efficacy					
Patient Safety					
Communication					
Pretest					
Posttest					
Readiness					
Knowledge					

Strength of Current Evidence

There was a consistency among all studies reporting a need for increased accessibility of care for patients suffering from OUD. The reasons cited for lack of patient access in all studies included fewer trained providers and proximity to a qualified provider. Patients who lived in rural areas needing MAT for OUD had difficulty finding a provider in their area who was trained in MAT and had a DEA waiver. For studies that examined provider training concerns, there was a noticeable significance in improving providers' knowledge attainment and an increase in providers' self-efficacy perceptions. Studies showed a consistent need for more DEA-waivered providers in rural regions, citing that some rural communities had no DEA waived provider. The number of patients allowable to be treated for OUD concurrently increased from 100 to 275 per provider in 2016, recognizing the increased need for waived buprenorphine providers. APRNs can fill this gap in care delivery but must obtain a DEA waiver. Though not a documented barrier, the time constraints associated with obtaining a DEA waiver were an important factor that affected access to care. DEA waived training requirements for physicians is eight hours, while APRN and PA providers require 24 hours of training to obtain the same DEA waiver.

While overall, there was an increase in the number of waived providers from 2017-2020, physicians had the lowest percentage of increase, and NPs had the highest. The studies suggested that physicians have decreased the number of patients they are treating for OUD with NPs filling the gap. NPs often practice in rural regions while many physicians depart these areas, leaving underserved communities. NPs are trained to care for these communities and are willing to do so. Research from this literature review supported the premise that NPs need to be more prepared to treat the rising OUD population, especially in the rural regions they serve.

Limitations of Current Evidence

The articles reviewed did not address how to prepare APRNs to care for OUD patients. They only discussed the need for trained providers. There was no designated, specific training method, material, or tool used for training. The only consistent activity mentioned was associated with the online DEA waiver training provided by the DEA, but none of these studies used the federally regulated activity in their studies. There was no mention of annual continuing education training requirements once obtaining a DEA waiver. The validity and reliability of these studies were difficult to assess due to inconsistencies in the tools used to evaluate knowledge attainment from the training.

Additional limitations were the lack of Level I and Level II data with few randomized control studies addressing the subject matter and, specifically, the APRNs' role in training. Much of the data obtained was from descriptive studies describing MAT OUD training barriers. There were few studies specifically analyzing comparison data, though many of the studies collected qualitative data only. Several of the studies used self-report surveys that could result in bias of the collected data.

Implication for Practice

Efforts to control the OUD epidemic depend on the availability of treatment. This treatment must be accessible to all patients and provided by trained prescribers. The research revealed few providers trained to prescribe approved medical therapy needed for OUD recovery. Those trained have specifications on the number of patients that can be treated concurrently, which, in turn, limits the availability of care. This has become a cycle in the healthcare industry. Breaking the process requires more MAT-trained and DEA-waivered providers in the practice setting willing to provide quality health care for this population.

In Georgia, APRNs have limited prescriptive authority but still have the authorization to prescribe Schedule III drugs in the presence of a DEA number and physician practice agreement. Buprenorphine is a schedule III MAT drug widely prescribed for patients with OUD. Of the board-certified NPs in Georgia, only 11% have become trained in MAT and obtained a DEA buprenorphine waiver (Varghese, et al., 2019). Of those who have a waiver, 23% treat patients in the rural underserved communities. These statistics provide insight into the importance of increasing the number of MAT-trained APRNs in Georgia.

Stakeholders

The opioid crisis has affected every citizen in the United States, and therefore, every citizen should be considered a stakeholder. The focus of this project concentrated on local stakeholders. National, regional, and local chapters of nursing organizations would be interested in the results of this study. These organizations include the American Nurses Association (ANA), Georgia Nurses Association (GNA), the United Advanced Practice Registered Nurses of Georgia (UAPRN), the American Nurses Credentialing Center (ANCC), the American Association of Nurse Practitioners (AANP), the American Academy of Physician Assistants (AAPA), the American College of Nurse-Midwives (ACNM) and the Georgia Board of Nursing (GBON). In addition to nursing organizations, the Georgia Composite Medical Board (GCMB) and the Medical Association of Georgia (MAG) have a vested interest in reviewing this study. It may have implications for the expansion of current prescriptive authority regulations APRNs in Georgia.

Community stakeholders are vital to the sustainability of any study and must be engaged early in the project implementation. Local stakeholders include practicing APRNs, criminal justice system employees and providers, physicians, community members, mental health

providers, family members, and patients with OUD. Additional stakeholders that are instrumental in the planning, implementation, and outcomes of this project include the collegiate community of Georgia College & State University (GCSU), specifically the College of Health Sciences and School of Nursing, students, faculty, and staff of the university, as well as, the project community chair, Dr. Jennifer Goldsberry, the project co-chair, Dr. Gail Godwin, a community representative, Dr. Sallie Coke, and the GCSU Institutional Review Board.

Feasibility

The implementation of this project did not incur an excessive cost to the researcher or stakeholders. Online surveys, training modules, and testing were done online utilizing a secure website. The website did not require a fee for service, strengthening the feasibility of implementation for the researcher. All participants were contacted via email, so there was no need for significant expenditures of office supplies or staffing needs. There were no monetary incentives offered to APRNs participating in this study.

Conclusions

The literature review solidified the impact that OUD has had on the nation's physical and financial health. The literature review also confirmed the importance of adequately educating providers on treatment modalities ties to combat the OUD epidemic. MAT training modules have proven effective in educating providers about OUD treatment modalities and increasing provider confidence in addressing this disease. The literature also reported that all types of MAT training were effective, suggesting many providers have had no exposure to OUD treatment or MAT therapy training before attending advanced training. Training is essential to controlling the opioid epidemic from further decline, but other barriers must be simultaneously addressed to increase

the sustainability of benefits. Barriers noted in the literature included lack of patient access, small number of DEA-waivered providers, and federal and state regulations for providers.

The lack of access to trained providers was as a significant and growing problem in rural communities, which have shown an increasing presence of OUD. The studies reviewed suggested that physicians are decreasing the number of patients they treat with NPs filling this gap. NPs practice in rural regions while many physicians depart these areas leaving underserved communities. NPs are trained to care for these communities and are willing to do so. Research from this literature review supports the premise that NPs need to be more prepared to treat the rising OUD populations, especially in the rural regions they serve.

Chapter III

Methodology

This study aimed to determine the educational needs of Advanced Practice Registered Nurses (APRNs) regarding the treatment of Opioid Use Disorder (OUD) and develop an appropriate academic intervention that would be easily replicable and applicable to all APRNs in the state of Georgia with hopes of encouraging more Drug Enforcement Agency (DEA) waived APRNs (Department of Health and Human Services, [DHHS], n.d.). A detailed proposal of this project was submitted and approved by the Georgia College and State University Institutional Review Board (IRB).

This section discusses the implementation plan to obtain the appropriate data necessary to address the following problem statements: 1) Will an online OUD and MAT training module increase APRN's knowledge of OUD and Medication-Assisted Treatment (MAT)? 2) Will years of experience as an APRN be correlated to current DEA-waiver status? 3) Will an OUD and MAT online training module increase the desire of APRNs' to become DEA-waived? 4) Will an

OUD and MAT online training module increase the desire of APRNs only practicing in rural areas to become DEA-waived? 5) Will an OUD and MAT online training module increase the desire of only Nurse Practitioners (NPs) with primary care/family practice board certification to become DEA-waived? 6) Are APRNs with professional or personal experience with OUD more likely to be DEA-waived than those without experience? 7) Are APRNs with professional or personal experience with OUD more likely to be DEA-waived than those without experience? 8) Will APRNs' years of professional experience with OUD be correlated to post module expression of interest in obtaining a DEA-waiver? The timeline from implementation to completion lasted four months, with initial implementation beginning on September 8, 2021 and completion on January 3, 2022.

Design

This DNP project utilized a pre-test/post-test design to determine the effectiveness of an online training module on APRNs' knowledge of MAT for OUD and their intentions toward obtaining a DEA waiver for OUD treatment. The pre-test was administered asynchronously to each participant once they agreed to participate and before completing the online training modules. Post-tests were issued two weeks following completion of the online training modules via email, using Qualtrics, a secure survey system.

Protection of Human Subjects

The protection of human subjects was ensured by following the basic ethical principles identified in the Belmont Report of 1979 (DHHS, n d). These principles included respect for persons, beneficence, and justice. Regarding respect for persons, each participant joined voluntarily after receiving adequate information about the study's aim and obtaining informed consent. No parental permission was needed for this study as all participants were older than 18

years of age. Beneficence was upheld by protecting the participants from any harm resulting from the research and offering benefits such as continuing education credits and increased knowledge to those who participated. Since demographic data collected included information about professional practices and settings, anonymity was ensured during data collection. The only contact information used to potentially be linked to the participant was the contact email address. To ensure the anonymity of this information, the contact email was assigned a numeric external identifier by the researcher that linked the email and the data collected. The data collected and external identifiers were kept in a password-protected laptop accessible only by the researcher. Any hard copies of data were kept in a locked drawer in the researchers' office. The researcher was the sole possessor of the assigned numerical identifier, and the results of the data collection were reported as aggregate data. Justice was ensured by allowing voluntary participation with the option to withdraw during the study.

The study design presented no known causes of physical harm to the participants. However, participants could have experienced emotional distress due to the study. Emotional pain, anxiety, or depression could have occurred due to the participants' past experiences, either personally or professionally, with OUD. To ensure the emotional wellbeing of the participants, the researcher stated before and after the survey that provided contact information for available helplines referral services and encouraged follow-up with a primary care provider should participants have encountered any undue stress. The primary investigator's contact information was provided to all participants should the need arise to discuss any concerns or distress brought about due to the study.

Participants were not compensated for participation in the study. However, there was an intrinsic incentive for each participant in knowing that they assisted in minimizing the opioid

epidemic. The study participants benefited by acquiring knowledge regarding the treatment of OUD. Furthermore, participants benefited by receiving free continuing education credits from participation in the study.

Population and Sample Size

The population of interest included all authorized APRNs in the state of Georgia. According to the Georgia Coalition of Advanced Practice Registered Nurses (CAPRN) website, there are more than 12,000 APRNs currently authorized in the form of Georgia (CAPRN, n d). An APRN was defined as a nurse who was authorized to practice in an advanced practice role and included Certified Registered Nurse Anesthetists (CRNA), Certified Nurse Midwives (CNM), Clinical Nurse Specialists (CNS), and Nurse Practitioners (NP) (American Nurses Association [ANA], n d). Nurse Practitioners make up 78% of the APRNs in Georgia. Of these, 686 are already DEA waived, leaving 89% unable to treat OUD. The remaining 89% (n = 8500) of nurse practitioners was the focus for this study (Varghese, et al, 2019). Those excluded from this study were retired APRNs, those with provisional or probationary APRN authorization status, and those who had previously completed the training module used. The sample size needed for evaluating the effectiveness of an online MAT module for APRNs and its significance in increasing interest in obtaining a DEA waiver was calculated using a power analysis. The apriori power analysis indicated a minimum required sample size of 78 participants to get a small effect size of 0.10 at a statistical power of eighty percent (Bonett & Wright, 2000). Therefore, assuming an attrition rate of 30%, the researcher aimed to recruit a minimum of 102 participants.

Recruitment/Informed Consent

A survey was emailed to all currently authorized APRNs in Georgia using contact information acquired from and with the permission of the United Advanced Practice Registered Nurses of Georgia (UAPRN). The welcome email contained a brief explanation of the study and certified the anonymity of the information requested. An informed consent (Appendix A) was included for the participant to review and explain the voluntary nature of the study as well as risks associated with participation. It stated that informed consent was given if the participant logged into the link provided in the initial email.

Risk and Data Security

All data collected was stored in a password-protected computer used only by the primary researcher. Once the raw data was obtained, it was used only for statistical analysis by the research team. No identifiable information was linked to participants for the statistical analysis. A link provided in each participant's email guided them to a secure website (Qualtrics.com ©) that protected their personal information and anonymity. Both demographic data and test scores were recorded anonymously with an individually assigned numerical code that could be linked only to the participants' email, pretest, and posttest scores, using Qualtrics © software.

Measurement Instruments

Demographic Survey

The demographic survey was created by the primary researcher and consisted of the following information: years of practice, type of practice setting, type of board certification, type of certification specialty, community practice setting, DEA authorization status, DEA waiver status, personal or professional experience with OUD, and interest in obtaining a DEA waiver. The demographic survey was entered into Qualtrics © and linked the individual participant's

email with the researcher-assigned numerical code to ensure further anonymity and continuity of matched data collection (Appendix B).

Pre-test MAT Module

The pre-test consisted of the same five questions that were used as the pre-test offered by the CDC Continuing Education Online (TCEO) training before completing *Module 5: Assessing and Addressing Opioid Use Disorder (OUD*) (Course: WB2863R) (CDC, 2018). The five multiple-choice questions each had four possible choices. Three of the five questions had the option of "select all that apply." Answers were scored on a 240-point scale, with each correct answer receiving a score of 20 points. The total score was recorded as the individuals' pre-test score, and the score was revealed to the test-taker after completing the online module. Though the test score was revealed, the participant could not preview their correct and incorrect answers. Upon completion of the demographic survey, access to the pre-test was available through Qualtrics. The pre-test result was linked to the participants' researcher-assigned numerical code to ensure anonymity and continuity of matched data (Appendix C). Upon completion of the pre-test, the participant was instructed on how to access the OUD/MAT training module.

Training Module for MAT

The OUD/MAT module instructions and accessibility were available via Qualtrics. The online training module used in this study was provided by the CDC Training and Continuing Education Online (TCEO) link used for multidisciplinary provider training in a variety of subjects. Christina Amikosz created these modules, an expert MD, MPH who is the Medical Officer of the Prescription Drug Overdose Health Systems Team and is also associated with the Division of Unintentional Injury Prevention, National Center for Injury Prevention and Control (NPIC), CDC, Office of Noncommunicable Diseases, and Injury and Environmental.

Health (ONDIEH) (CDC, 2018.) The CDC endorsed these modules and they were free of charge to providers (CDC, 2018). The training module was an interactive video that allowed participants to view the training at their own pace, answer questions about case scenarios, and provide a rationale for the answers (CDC, 2018). The module took approximately 50 minutes to complete (Appendix D). According to The White House Office of the Press Secretary (2016), more than 66,000 providers had completed this CDC provider training on OUD over three months in 2016, with a projected 540,000 providers completing the movement by 2020. Upon completion of the module, participants could see their pre-test scores. The researcher was notified through Qualtrics when each participant completed the module.

Post-test MAT Module

The post-test consisted of the same five questions used as a knowledge comprehension assessment post-test of OUD and MAT training provided in *Module 5: Assessing and Addressing Opioid Use Disorder (OUD*) (Course: WB2863R) (CDC, 2018). An email was sent to each participant two weeks after completing the pre-test and training module (Appendix E) and provided a link for the post-test and module completion survey (Appendix F). Participants were asked to complete the post-test and module completion survey within one week of receiving the email link. An additional email was sent ten days after completion as a reminder and encouraged the participant to complete the posttest and survey. A final email reminder email was sent on day 12.

The post-test contained the same five multiple-choice questions as the pre-test. The post-test was scored on a 240-point scale, with each correct answer counting 20 points. The total score was recorded as the individuals' post-test score. The post-test score was revealed immediately upon completion of the module completion survey. Unlike the pre-test results, the post-test

results allowed the participant to view questions they answered correctly and incorrectly. Access to the post-test was available through Qualtrics and was recorded as the individuals' post-test score. The post-test result was linked to the participants' researcher-assigned numerical code to ensure anonymity and continuity of matched data collection.

Completion Survey

A researcher-developed completion survey used a seven-point Likert scale ranging from strongly disagree to strongly agree and consisted of eight questions requesting feedback on training objectives and interest in additional training. To the researchers' knowledge, this data has not been collected by the CDC previously. However, the researcher disseminated these findings with the CDC through communication via email and presentation. This survey was entered into Qualtrics secure survey site to ensure anonymity (Appendix G).

Certification of Completion

Each participant received a post-completion email that included the participants' pre-and post-test scores and provided contact information for available helplines or referral services should include the participant encounter any undue stress during the study. This email provided instructions on obtaining continuing education credits for this training through the CDC TCEO website (Appendix H).

Chapter IV

Results

This correlational descriptive study on factors of knowledge assessment and interest in obtaining a DEA waiver using a pre-and post-module intervention is reported here. Findings include descriptive characteristics of participants, instrumentation, and data addressing the clinical questions.

Initial data screening was performed before conducting the statistical analyses. Data collected using the Qualtrics software was uploaded into SPSS 27.0 software. The two databases were compared and examined. No discrepancies were found between the two databases. The study's instruments were examined for missing items. Of the 89 participants, one participant failed to answer community practice setting and personal experience with opioid use disorder (OUD). Another participant was unable to respond years of professional experience. Five participants were unable to answer board certification type, and nine were unable to respond to board certification specialty. Two participants did not answer the question about post-module DEA waiver interest. Two participants had greater than 20% missing data on the pre-module test, and two had more than 20% missing data on the post-module test. These four participants' data were not used.

Data Analysis

After reviewing all interval and ratio level data for central tendencies, it was found that years of practice, years of professional experience, pretest total scores, and posttest full scores were not normally distributed. The Fisher's Exact score for skewness of years of practice was 2.42 with a kurtosis of -0.60 (Keller and Kelvin, 2013). Further examination of the data revealed three participants' score for years of practice were three standard deviations above the mean score (Tabachnick and Fidell, 2013). After removal of those participants' scores, the data was normally distributed with a Fisher's Exact score of 1.73 for skewness and 1.19 for kurtosis (Keller and Kelvin, 2013).

The Fisher's exact score for the pretest total score was -4.75 with a kurtosis of 2.47 (Keller and Kelvin, 2013). Further examination of the data revealed one participant's pretest total score was greater than three standard deviations below the mean (Tabachnick and Fidell, 2013).

After removal of that participant's score, the data was normally distributed with Fisher's exact skewness of -1.97 and kurtosis of 0.27 (Keller and Kelvin, 2013).

The Fisher's exact score for the posttest total score was -12.01 with a kurtosis of 5.74 (Keller and Kelvin, 2013). Further examination of the data revealed three participants' posttest total scores were greater than three standard deviations below the mean (Tabachnick and Fidell, 2013). After removal of these participants' scores the data was normally distributed with Fisher's exact skewness of -1.33 and kurtosis of -1.12 (Keller and Kelvin, 2013).

The Fisher's Exact score for skewness of years of professional experience was 13.56 with a kurtosis of 8.73 (Keller and Kelvin, 2013). Further examination of the data revealed three participants' scores for years of professional experience were three standard deviations above the mean score (Tabachnick and Fidell, 2013). After removal of those participants' scores, the data continued to be abnormally distributed with a Fisher's Exact score of 6.00 for skewness and 1.64 for kurtosis (Keller and Kelvin, 2013). Further data manipulation would have removed several more participants; therefore, a statistical correction using an inverse natural logarithm was attempted on the variable as recommended by Tabachnick and Fidell (2013). After conducting the inverse natural logarithm, the variable remained non-normally distributed; therefore, all analysis using this variable was analyzed using nonparametric testing. All remaining data were normally distributed and met the assumptions of all parametric statistical analyses used to answer the clinical research questions.

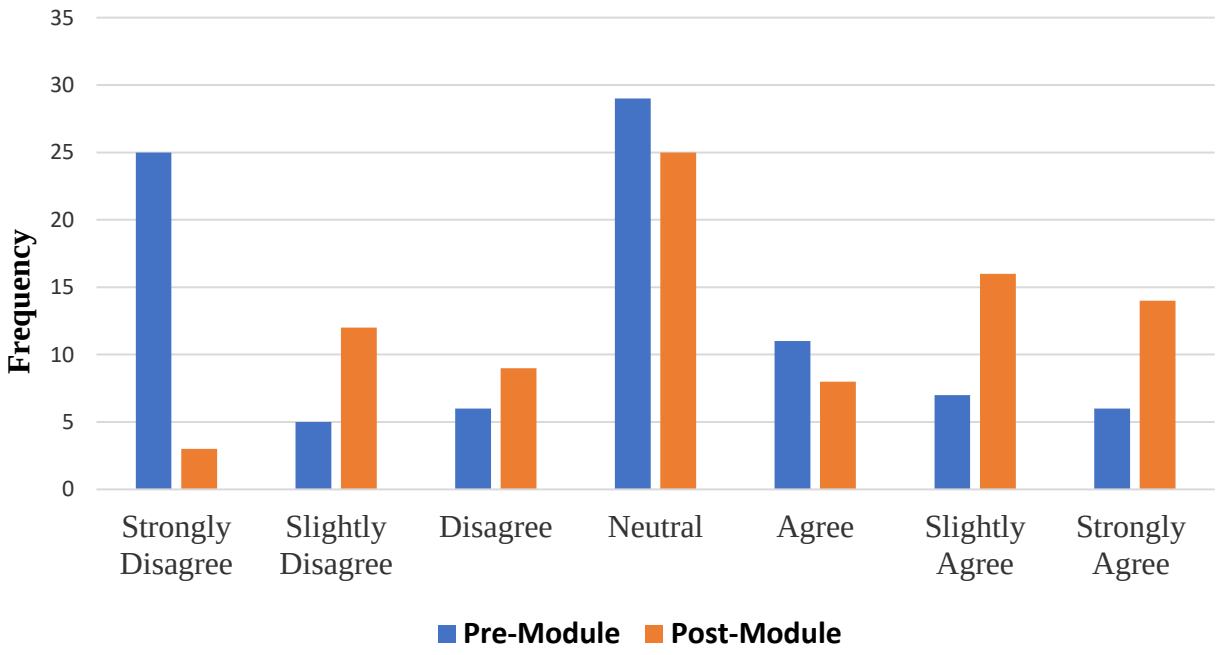
The participants' years of APRN experience ranged from 0 - 34 with a mean of 10.30 (*SD* = 6.75). Of the 89 participants in this study, 55 were board certified as NPs (61.8%). Thirty-six participants (40.4%) reported working in primary care setting. Fifty-two participants served in the rural community (58.4%) and thirty-six in the urban community (40.4%). Of the

participants, 55.1% (*n* = 49) had a DEA authorization while only 9% (*n* = 8) had a DEA waiver. Fifty participants (56.2%) reported having some type of experience, either personal or professional, with OUD.

Using a Likert scale of 1 – 7, the mean score for pre-module interest in obtaining a DEA waiver interest was 3.46 with standard deviation of 1.89. The mean score for the post-module interest was 4.45 with standard deviation of 1.74. Frequencies for each of the 1 through 7 ordinal rating of the Likert scale score in reference to pre-module DEA waiver interest are displayed in Figure 7. Additional details about the participants in this study are listed in Table 5.

Figure 7

Frequencies of Pre-module and Post-module Interest in Obtaining DEA waiver



Note. This graph depicts the frequencies of pre-module and post-module interest scores in obtaining DEA waiver using Likert scale scoring.

Table 5

Descriptive Characteristics of Advanced Practice Registered Nurses

Variables	*N*	%	*Mean (SD)*	Range
Board certification type				
Nurse Practitioner	55	61.8		
Clinical Nurse Specialist	10	11.2		
CRNA[a]	13	14.6		
Certified Midwife	5	5.6		
Did not answer	5	5.6		
Board certification specialty				
Primary Care/Family Practice	36	40.4		
Not a NP[b]	21	23.6		
Adult Gerontology	10	11.2		
Acute Care/ER	4	4.5		
Women's Health/Pediatrics	6	6.7		
Psych/Mental Health	2	2.2		
Did not answer	9	10.1		
Personal experience with OUD				
No	70	78.7		
Yes	18	20.2		
Professional experience with OUD				
No	57	64.0		
Yes	32	36.0		
Years professional experience			1.5 (3.2)	0 - 20
Pre-module DEA[c] waiver interest				
Disagree	36	40.4		
Agree	24	27.0		
Neutral	29	32.6		
Pretest Total Score			187.1 (35.6)	100 - 240
Posttest Total Score			215.0 (20.7)	160 - 240
Post module DEA waiver interest				
Disagree	24	27.0		
Agree	38	43.1		
Neutral	25	28.1		
Did not answer	2	2.8		

Note. [a] CRNA- Certified Registered Nurse Anesthetist. [b] Nurse Practitioner. [c] Drug Enforcement Agency.

Description of the Instruments

This section describes the study instruments, mean scores, and standard deviations. Table 6 provides additional information about instrumentation. Instrumentation scoring used as continuous variables were not normally distributed for the pre-test and post-test total score. Procedures to correct those variables were discussed above.

Pre-module Test

Module 5: Assessing and Addressing Opioid Use Disorder (OUD) (WB2863R).

Pretest knowledge of OUD was evaluated using a five-item exam adopted from the Centers for

Disease Control online teaching course WB2863R. Two questions had a score range of 0 - 20, two questions had a score range from 0 - 60, and the remaining question had a range from 0 - 80 points (CDC, 2018). Respondents were given the five-item pretest which offered four possible answers referencing their knowledge of OUD. Three of the five items had multiple answers with instructions to "select all that apply".

Post-module test

Module 5: Assessing and Addressing Opioid Use Disorder (OUD) (WB2863R).

Posttest knowledge attainment of OUD was evaluated using the same five-item exam that was used as the pretest. It was adopted from the Centers for Disease Control online teaching course WB2863R. Two questions had a score range of 0 - 20, two questions had a score range from 0 - 60, and the remaining question had a range from 0 - 80 points. (CDC, 2018). Respondents were given the five-item pretest which offered four possible answers referencing their knowledge of OUD. Three of the five items had multiple answers with instructions to "select all that apply".

Post-module Completion Survey

The post-module completion survey was researcher-developed and contained eight items. Each item utilized a 7-point Likert scale with scoring of "1" as strongly disagree, "2" slightly disagree, "3" disagree, "4" neither disagree or agree, "5" agree, "6" slightly agree, and "7" as strongly agree. Three of the eight items addressed the conciseness, pertinence, and usefulness of the module. An additional three items surveyed the confidence level and applicability of the module to current practice. The remaining two items assessed the participants' interest in further training for OUD.

Table 6

Description of Research Instruments

Variable	*M (SD)*	Observed Range	Possible Range
Pretest Question1	16.4 (7.8)	0 - 20	0 - 20
Pretest Question2	41.3 (16.7)	20 - 60	0 - 60
Pretest Question3	41.7 (19.6)	0 - 60	0 - 60
Pretest Question4	69.2 (15.3)	20 - 80	0 - 80
Pretest Question5	12.8 (9.7)	0 - 20	0 - 20
Pretest Total Score	187.1 (35.6)	100 - 240	0 - 240
Posttest Question1	16.7 (7.5)	0 - 20	0 - 20
Posttest Question2	53.4 (12.5)	20 - 60	0 - 60
Posttest Question3	52.5 (11.1)	20 - 60	0 - 60
Posttest Question4	72.8 (12.1)	20 - 80	0 - 80
Posttest Question5	15.9 (8.0)	0 - 20	0 - 20
Posttest Total Score	215.0 (20.7)	160 - 240	0 - 240

Analysis of the Research Questions

Prior to beginning the analysis, the variables of years of practice, community setting, DEA waiver status, personal and professional experience with OUD, years of professional experience with OUD, pre-module interest in DEA waiver, pre-test total score, post-test total score, and post-module interest in DEA waiver were examined for multicollinearity. There were few significant correlations between the variables.

Except for the demographic variables of history of professional experience with OUD in

relation to the number of years of professional experience with OUD, none were greater than .338 (Keller and Kelvin, 2013) indicating multicollinearity was not a problem with those variables. Those with professional experience with OUD and number of years of professional OUD experience were strongly correlated *(r* = .664, *p* < .01*)* indicating these measured similar concepts. Table 7 describes the Pearson correlations between all the main variables in this study.

Table 7

Pearson Correlations between Variables

	YOP	COMM	DEAW	PERHX	PROHX	YPRO	PREDI	PRESCR	POSTSCR
YOP	-								
COMM	-.113								
DEAW	-.009	.330**							
PERHX	-.075	-.119	.232*						
PROHX	-.069	-.123	.338**	.261*					
YPRO	-.050	-.056	.206	.156	.664**				
PREDI	-.228*	-.195	.027	.264*	.288**	.142			
PRESCR	-.285**	-.044	.179	.089	.230*	.245*	.289**		
POSTSCR	-.234*	-.067	.078	.055	.189	.072	.118	.171	
POSTDI	.034	-.026	.076	-.043	.086	-.022	.072	-.057	.136

Note. YOP-years of practice. COMM- community practice setting. DEAW- Drug Enforcement Agency waiver status. PERHX- personal experience with OUD. PROHX- professional experience with OUD. YPRO- years of professional practice with OUD. PREDI- pre module interest in obtaining DEA waiver. PRESCR- pretest total score. POSSCR- posttest total score. POSTDI-post module DEA waiver interest.
* $p < .05$. ** $p < .01$.

Results of Clinical Question 1

Clinical question 1: Will an online OUD and MAT training module increase APRN's knowledge of OUD and Medication Assisted Treatment (MAT)? A dependent sample paired *t-test* was performed to determine whether there was a statistically significant mean difference between the pre-test and post-test scores of all participants. Prior to beginning the analysis, the

data was examined to determine if it met the assumptions for paired *t-test* calculation. The data was normally distributed, and the assumptions were supported. Data revealed there was a statistically significant increase in scores from pretest (M = 187.1, SD = 35.6) to posttest (M = 215.0, SD = 20.7) t (75) = 5.78, $p < .001$. The results support the study's hypothesis. Participants in this study showed an increase in knowledge of OUD and MAT after completing the training module.

Results of Clinical Question 2

Clinical Question 2: Will an online OUD and MAT training module increase the desire of APRNs' to become DEA-waived? A dependent sample paired *t-test* were performed to determine whether there was a statistically significant mean difference between the pre-module and post-module interest in obtaining a DEA waiver and posttest scores of all participants. Prior to beginning the analysis, the data was examined to determine if it met the assumptions for paired *t-test* calculation. The data was normally distributed, and the assumptions were supported. There was a statistically significant difference between the pre-module interest (M = 3.5, SD = 1.9) and post-module interest (M = 4.5, SD = 1.8) t (75) = 3.33, p = .001. Participants' interest in obtaining a DEA waiver did show an increase from pre-module to post-module after completing the training module.

Results of Clinical Question 3 and 4

Clinical Question 3: Will an online training module increase the desire of APRNs practicing in rural areas to become DEA-waived? Clinical Question 4: Will an online training module increase the desire of board-certified primary care/family practice nurse practitioners to become DEA-waived? Dependent sample paired *t-tests* were performed to determine whether there was a statistically significant mean difference between the pre-module and post-module

interest in obtaining a DEA waiver in two subsample groups, APRNs practicing in rural communities and board-certified Primary Care/Family Practice NPs. Prior to beginning the analysis, the data was examined to determine if it met the assumptions for paired *t-test* calculation. The data was normally distributed, and the assumptions were supported. Table 8 describes the results from these subsample groups. There was no statistically significant difference between pre-module interest and post-module interest in rural APRNs, but there was a statistically significance difference in Primary Care/Family Practice NPs' interest in obtaining a DEA waiver. Rural APRNs' interest did not increase from pre-module to post-module for APRNs practicing in rurally but did increase for those participants who were board-certified Primary Care/Family Practice NPs.

Table 8

Dependent samples t-tests for pre and post module interest DEA waiver[a] interest of rural[b] APRNs and Primary Care NPs[c]

Variable	*M (SD)*	Possible Range	Actual Range	*t*
Pre-module interest[a] of Rural APRNs[b]	3.74 (1.78)	1 – 7	1 – 7	1.50
Post-module interest of Rural APRNs	4.38 (1.99)	1 – 7	1 – 7	
Pre-module interest Primary Care NPs[c]	3.71 (1.92)	1 – 7	1 – 7	2.09*
Post module interest Primary Care NPs	4.47 (1.85)	1 – 7	1 – 7	

Note. [a]Interest in obtaining a DEA waiver. [b]APRNs practicing in rural communities. [c]Nurse Practitioners with Primary care/family practice board specialty.

*$p < .05$.

Results of Clinical Question 5

Clinical Question 5: Will APRNs' DEA-waiver status be correlated to years of professional experience with OUD? Correlational analysis was used to test the hypothesis that participants with more years of professional experience with OUD correlate with participants'

DEA waiver status. Since this data was not normally distributed prior to data manipulation, a Spearman's Rho Correlation was done using the original data. A significant correlation was found ($rs = .341$, $p = .001$) between years of professional experience and DEA-waiver status. Participants in this study who reported having more years of professional experience with OUD were also more likely to be DEA waivered.

Results of Clinical Question 6

Clinical Question 6: Are APRNs with personal or professional experience with OUD more likely to be DEA-waived than those without? Chi-square analysis was performed to determine if there was a relationship between APRNs' with person or professional experience with OUD and DEA waiver status. Prior to analysis, data was examined to determine if it met the assumptions for analysis. There were an inadequate number of cell frequencies in the group containing those with a DEA waiver but no personal or professional experience with OUD, therefore a Chi-square was not performed. Of the 86 participants in this study, 54.7% ($n = 47$) reported having experience with OUD while 45.3% ($n = 39$) did not. Table 9 provides details of the percentages of those with and without experience in relation to DEA waiver status.

Table 9

Percentages of Experience with OUD[a] and DEA waiver status

Variable	*N*	*%*
With Experience		
With DEA waiver	7	17.9
Without DEA waiver	32	41.0
Without Experience		
With DEA waiver	1	2.1
Without DEA waiver	46	59.0

Note. [a]Personal or professional experience with OUD.

Results of Clinical Question 7

Clinical Question 7: Will APRNs with personal or professional experience with OUD be more likely to express post module interest in obtaining a DEA waiver than those without? An independent *t-test* was performed to determine whether there was a statistically significant mean difference in expression of post module DEA waiver interest between participants with personal or professional experience with OUD and those without experience. Prior to beginning the analysis, the data was examined to determine if it met the assumptions for *t-test* calculation. The data was normally distributed, and the assumptions were supported. There was no statistically significant difference between post-module DEA waiver interest t (82) = .557, p = .732 in those with experience with OUD (M = 4.62, SD = 1.80) and those without experience (M = 4.40, SD = 1.74). Participants with personal or professional experience did not express more post module interest in obtaining a DEA waiver than those without experience.

Conclusion

This chapter presented the results of this translational project. A total of 89 APRNs in the state of Georgia were recruited anonymously through nursing forums and websites. Results from this study indicate the completion of an online training module focusing on OUD and MAT was beneficial in increasing both knowledge assessment and interest in obtaining a DEA waiver. Examination of the data from subgroups did not show statistically significant differences between pre- and post- module interest in APRNs practicing rurally but did show statistically significant differences in board-certified primary care/family practice NPs. Participants who reported more years of professional practice with OUD were more likely to be DEA waivered. Post module interest in obtaining a DEA waiver was not statistically different between those with personal or professional experience than those without.

Chapter V

Conclusions

Implications for Practice

The results of this study show that an online training module for APRNs in Georgia was successful in increasing knowledge of both OUD and MAT. These findings were consistent with other research findings that implemented similar or alternate forms of training on OUD. This supports the premise that any form of training on OUD and MAT will increase the knowledge attainment for APRNs. The statistically significant increase from pre-module to post-module test scores suggest exposure to content is necessary for preparing APRNs to treat OUD.

In addition to the increase in knowledge, there was a statistically significant increase from pre-module to post-module expression of interest in obtaining a DEA waiver. The increase in post-module interest is a powerful indicator that educating APRNs increases the cultural awareness of the effects of OUD that maybe they were not aware of prior to the training. The increased interest of APRNs to obtain a DEA waiver implies that there could be an increase in the number of DEA-waived APRNs with increased training. An increase in the number of DEA-waived APRNs would increase access to care for individuals suffering from OUD and will ultimately aid in minimizing the harmful effects of the opioid epidemic.

Strengths and Limitations

While there were many studies that reviewed OUD/MAT training methods, there were no studies that included APRNs as participants who practiced in a restrictive environment. Georgia is one of the few states that still has restricted prescriptive practice authority for board-certified APRNs. This study's results can be considered both a strength and limitation. Since this is one of the only studies using APRN participants from a restricted environment, the findings are useful

in providing insight into capabilities that could result from granting public practice authority to currently restricted practice APRNs. Limitations of this study regarding restrictive practice authority include difficulty in recruitment of APRNs and the relevance of the training in practice. Because of the restricted practice authority for APRNs in Georgia, resulting in the inability to treat OUD to its full capacity, participants were difficult to recruit, citing the training was not helpful under current restrictions. Therefore, restricted practice regulations may have impacted participants' perception of the usefulness and relevance of the training to their practice setting. This restriction likely caused some APRNs to choose not to participate in the study.

The results of this study provide a basis for future arguments in allowing Georgia APRNs to pursue the non-restrictive practice. Should those who oppose granting full practice authority to board-certified APRNs in Georgia review the study results, it may provide some valid reasoning to allow full practice authority. The increased interest in obtaining a DEA waiver by those who participated may encourage the opposing entities to reconsider the current practice regulations in hopes that APRNs would assume the care of those with OUD once they are granted full practice authority.

While the training module used in this study was concise, pertinent, and easily accessible, the content was presented in two parts. The second part was sent two weeks after the initial training. The entire training took approximately one hour to complete, which was a deterrent for some participants. Some participants who started the study did not complete it, and thus, their information could not be used in the data analysis. A few participants completed the initial training but failed to complete the final part; therefore, their data was not used. Those who completed both parts of the training reported the module was useful for educating about OUD. Providing financial or compensatory incentives for the completion of both parts of the study may

have increased recruitment and retention numbers. Some studies (Huhn & Dunn, 2017; Painter, 2017; Tilley et al., 2019) focused on OUD training addressed the presence or absence of stigma, bias, or prejudice of the provider towards those patients suffering from OUD. While this study did not incorporate concepts of bias into the training, it must be considered that these concepts could have been factors impacting the lack of participation by APRNs. It is unclear if those who chose not to participate resulted from personal or professional bias or prejudice with OUD or if the stigma associated with OUD, was a determining factor. Future studies should include information about the role prejudice or bias plays in the willingness of APRNs to participate in like studies about OUD. Other considerations for future studies should address how the stigma associated with OUD affects APRNs' interest in caring for these patients.

While OUD is a pertinent medical concern for the nation, the timing of implementation for this study was overshadowed by the current epidemic. The presence of COVID-19, with its resurgence and increased mortality and morbidity rates, was the most concerning medical condition at the time of this study and may have diminished the pertinence of other chronic medical conditions, including OUD. Studies focused on COVID-19 and it's after-effects were more applicable when this study was implemented. The results may have been different if this study had been conducted before the COVID epidemic.

Recommendations for Future Research

While this study provided valuable data for assessing APRNs' knowledge of OUD and MAT treatment modalities, the study did not determine why those practicing in rural environments were less likely to express post-module DEA-waiver interest. OUD has been on the rise in rural communities. Many of these communities do not have a primary care provider, and those who do are not prepared to treat OUD. APRNs, specifically NPs, often serve these

smaller communities, which makes one wonder why they are not interested in obtaining a DEA waiver. A follow-up study focusing on rural APRNs' willingness or lack thereof, to treat OUD, would be instrumental in evaluating contributing barriers present for those who possess the skills and knowledge to eradicate the presence of OUD rurally.

Additional research is needed to determine the prevalence of stigma, bias, or prejudice that exists in APRNs in Georgia. Having this data before implementing this project may have changed the study's aims and provided insight into why those who have personal or professional experience with OUD did not express interest in learning more about OUD or obtaining a DEA waiver to treat OUD. A follow-up study examining the attitudes of board-certified APRNs toward patients suffering from OUD would be helpful in future studies focusing on accessibility to care.

Conclusion

While the increase in post-module knowledge was an expected finding, post-module interest in obtaining a DEA waiver was not. This surprising finding provides hope that APRNs in Georgia understand the significance of the opioid crisis and are aware of their role as a provider in controlling its effects. The need for more DEA-waived providers, in combination with the willingness of APRNs to treat OUD, may be instrumental in assisting state regulators in reconsidering the limitations of practice authority for APRNs in Georgia.

Appendix A

Informed consent for study

INFORMED CONSENT

I, _____, agree to participate in the research of APRN education in Medication Assisted Treatment (MAT) training for Opioid Use Disorder (OUD) which is being conducted by Angela Queen Roberts, who can be reached at angela.roberts1@gcsu.edu. I understand that my participation is voluntary; I can withdraw my consent at any time. If I withdraw my consent, my data will not be used as part of the study and will be destroyed.

The following points have been explained to me:

1. The purpose of this study is to increase the knowledge of opportunities for APRNs to acquire MAT training.
2. The procedures are as follows: you will be asked to complete a demographic survey, a pre-test, a training module, a post-test, and feedback survey.
3. Your name will not be connected to your data. Therefore, the information gathered will be confidential.
4. You will be asked to review this consent form. You will provide your consent by accessing the demographic survey of the module listed in this email.
5. You should not find any of the questions invasive, but some questions may be personal. If you become uncomfortable answering any questions, you may cease participation at that time.
6. This research project is being conducted because of its potential benefits, either to individuals or to humans in general. The expected benefits of this study include educating APRNs about opioid use disorder and medications approved for treatment.
7. You are not likely to experience physical, psychological, social, or legal risks beyond those ordinarily encountered in daily life or during the performance of routine examinations or tests by participating in this study.
8. Your individual responses will be confidential and will not be released in any individually identifiable form without your prior consent unless required by law.
9. The investigator will answer any further questions about the research should you have them now or in the future (see above contact information).
10. In addition to the above, further information, including a full explanation of the purpose of this research, will be provided at the completion of the research project on request.
11. By signing and returning this form, you are acknowledging that you are 18 years of age or older.

Signature of Investigator Date

Signature of Participant Date

Research at Georgia College involving human participants is carried out under the oversight of the Institutional Review Board. Address questions or problems regarding these activities to the GC IRB Chair, email: irb@gcsu.edu.

Appendix A

Welcome Recruitment Email

Thank you for participating in this study which discusses the role of MAT in the treatment of opioid use disorder. Data for this study will be collected anonymously and contact information will be limited to your email address for distribution purposes only. ***The training should take approximately 1 hour to complete.***

Should you experience any emotional distress as a result of participating in this study, please follow-up with your primary care provider as soon as possible and contact the Substance Abuse and Mental Health Services Administration National Helpline at 1-800-662-4357 or online at https://www.samhsa.gov/find-help/national-helpline or Georgia Council On Substance Abuse at (404) 523-3440 or online at http://www.gasubstanceabuse.org.

Before you begin, please review the informed consent attached to this email.

Informed Consent MAT AR

You will indicate your consent to participate by clicking on the link below which will start the module. You will have two weeks to complete this portion of the training. Two weeks after completion of the training, you will receive a post-test and a post-completion survey.

Please remember your participant identification number (PIN) all both parts of the training. You will be asked to enter this number on the demographic survey and then again when you received the post-test and post-completion survey.

Your researcher assigned PIN: _____

Appendix B

Demographic Survey

What is your participant identification number (PIN) assigned by the researcher? _____

How many years have you been practicing as an APRN? _____

What type of APRN board certification do you have? Select all that apply.

- ☐ Certified Registered Nurse Anesthetist
- ☐ Certified Nurse Midwife
- ☐ Clinical Nurse Specialist
- ☐ Nurse Practitioner

If you a NP, what is your board certification specialty? Select all that apply.

- ☐ Adult-Gerontological
- ☐ Acute Care/Emergency
- ☐ Primary Care/Family
- ☐ Neonatal
- ☐ Pediatric
- ☐ Psychiatric Mental Health
- ☐ Women's Health/Obstetrics
- ☐ None of These

☐ I am not a NP

What type of community do you serve?

○ Rural

○ Urban

Do you currently have a DEA authorization to prescribe under a nurse protocol?

○ Yes

○ No

Do you have DEA waiver to prescribe buprenorphine?

○ Yes

○ No

Do you have any personal experience with OUD?

○ Yes

○ No

Do you have any professional experience with OUD?

○ Yes

○ No

If yes, how many years of professional experience do you have in providing direct medical care assisting patients with OUD? _____

Please answer the following question using a scale of 1 to 7 with:
1=strongly disagree, 2=slightly disagree, 3=disagree, 4= neither disagree nor agree 5=agree, 6=slightly agree, and 7=strongly agree
I am interested in obtaining a DEA waiver to treat opioid use disorder. _____

Appendix C

MAT Module Pre-test

How many defined criteria need to be met according to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) to be diagnosed with Opioid Use Disorder (OUD)?

- ○ At least two of the defined criteria within a single year
- ○ At least one of the defined criteria within a single year
- ○ At least two of the defined criteria within two years
- ○ At least one of the defined criteria within two years

Which of the following interventions are suggested if you suspect OUD in a patient? Select all that apply.

- ○ Perform Urine Drug Testing (UDT) and review data from your state's prescription drug monitoring program (PDMP)
- ○ Use the DSM-5 criteria to assess for the presence of OUD and/or arrange for assessment with a substance use disorder specialist.
- ○ Dismiss your patient from care.
- ○ Discuss your concern with your patient and provide an opportunity for them to disclose any related concerns or problems.

What medications are used as medication-assisted therapy (MAT) for OUD? Select all that apply.

- ○ Methadone
- ○ Buprenorphine
- ○ Fluoxetine
- ○ Naltrexone

Which of the following considerations are relevant for medication-assisted therapy (MAT)? Select all that apply.

- Patient Education
- Co-occurring disorders
- Integration of pharmacologic and nonpharmacologic therapies
- Referrals to higher levels of care if needed.

Which of the following requires a waiver to administer outside of an opioid treatment program? Select the best answer.

- Naltrexone
- Buprenorphine
- Methadone
- Naloxone

Appendix D

OUD/MAT training module

To complete this module, you will be asked to watch an interactive video about treating Opioid Use Disorder with Medication Assisted Treatment (MAT).

Once you have completed the video training a notification will be sent to the trainer. One week after receiving the notification you will be sent an email asking you to complete a 5-question post-test and an 8-question post completion survey about the training module.

After the completion of the post-test and survey you will be provided with information about how to obtain CME credits for completing this course.

To begin please highlight and right click on the link below. Choose the options "go to" and you will be connected to the training link. You will be prompted to answer questions embedded in the video.

https://www.cdc.gov/opioids/providers/training/assessing-addressing-oud.html

Appendix E

Module Completion Email

Dear Participant,

Thank you for completing this training module. In two weeks, a 5-question post-test and 8-question post-completion survey will be sent to you. Once you have completed the post-test and completion survey, you will be provided a link that will allow you to formally register for this class on the CDC website to obtain CME credit at your convenience.

Please remember your participant identification number (PIN) all both parts of the training. You will be asked to enter this when you received the post-test and post-completion survey.

Your researcher assigned PIN: _____

Appendix F

MAT Module Post-test

What is your participant identification number (PIN) assigned by the researcher? _____

How many defined criteria need to be met according to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) to be diagnosed with Opioid Use Disorder (OUD)?

- ○ At least two of the defined criteria within a single year
- ○ At least one of the defined criteria within a single year
- ○ At least two of the defined criteria within two years
- ○ At least one of the defined criteria within two years

Which of the following interventions are suggested if you suspect OUD in a patient? Select all that apply.

- ○ Perform Urine Drug Testing (UDT) and review data from your state's prescription drug monitoring program (PDMP)
- ○ Use the DSM-5 criteria to assess for the presence of OUD and/or arrange for assessment with a substance use disorder specialist.
- ○ Dismiss your patient from care.
- ○ Discuss your concern with your patient and provide an opportunity for them to disclose any related concerns or problems.

What medications are used as medication-assisted therapy (MAT) for OUD? Select all that apply.

- ○ Methadone
- ○ Buprenorphine
- ○ Fluoxetine
- ○ Naltrexone

Which of the following considerations are relevant for medication-assisted therapy (MAT)? Select all that apply.

- Patient Education
- Co-occurring disorders
- Integration of pharmacologic and nonpharmacologic therapies
- Referrals to higher levels of care if needed.

Which of the following requires a waiver to administer outside of an opioid treatment program? Select the best answer.

- Naltrexone
- Buprenorphine
- Methadone
- Naloxone

Appendix G

Post Completion Survey

Please evaluate the training module objectives on a scale of 1 to 7 with

1=strongly disagree, 2=slightly disagree, 3=disagree, 4= neither disagree nor agree 5=agree, 6=slightly agree, and 7=strongly agree

	1	2	3	4	5	6	7
The module was concise and easy to understand.	○	○	○	○	○	○	○
The content was pertinent to our nation's health.	○	○	○	○	○	○	○
I learned something new from this module.	○	○	○	○	○	○	○
I feel confident identifying patients at risk for or suffering from OUD.	○	○	○	○	○	○	○
I understand how MAT is used in OUD treatment.	○	○	○	○	○	○	○
I will use what I learned in my current practice.							
I am interested in learning more about OUD/MAT treatment for my patients.	○	○	○	○	○	○	○
I am interested in obtaining a DEA waiver to treat opioid use disorder.	○	○	○	○	○	○	○

Appendix H

Study Completion Email

Thank you for your participation and for providing feedback for this study.

Your pretest score was _____

Your posttest score was _____

Should you experience any emotional distress as a result of participating in this study, please follow-up with your primary care provider as soon as possible and contact the Substance Abuse and Mental Health Services Administration National Helpline at 1-800-662-4357 or online at https://www.samhsa.gov/find-help/national-helpline or Georgia Council On Substance Abuse at (404) 523-3440 or online at http://www.gasubstanceabuse.org.

To obtain continuing education credit for this course:

Highlight and click on link below. You will be asked sign in or register a new account.

Once you sign in you must register for the course.

Search for ***WB2863R* or *Module 5: Assessing and Addressing OUD*** to register for the course.

Once registered you will have to restart the course link video, but you can move through it quickly. It is the same video you watched for this training.

Once you complete the video you can take the post-test which is the same test you completed before and after the training for this study.

Once you pass the posttest you can print your CME certificate.

https://tceols.cdc.gov

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