

Impact of Telemedicine on Retention in Medications for Opioid Use Disorder (MOUD) Treatment With Buprenorphine in the Times of COVID-19 Pandemic: A Retrospective Chart Review

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This study reviewed the impact of telemedicine on treatment retention in Medications for Opioid Use Disorder (MOUD) with buprenorphine treatment program during the coronavirus disease 2019 (COVID-19) pandemic. Electronic health records of active patients in MOUD with buprenorphine treatment program were reviewed from July 1, 2019, to June 30, 2020. Data were divided into four groups of 3-months' time points to calculate and compare treatment retention in the baseline, pre-COVID, and in-COVID groups. The percentage of treatment retention with a 95% confidence interval was calculated using University of California San Francisco- Clinical and Translational Science Institute (UCSF-CTSI) sample size calculator tool. This study presents data suggesting that telemedicine is efficacious in retaining patients in MOUD. Telemedicine is an alternative to face-to-face treatment delivery for MOUD with buprenorphine treatment. It should be available to provide services after the pandemic as well.

Public Health Significance Statement

Addressing Opioid Use Disorder (OUD) is essential to reduce individual and societal harms associated with drug overdoses. Because of the need for social isolation and social distancing related to coronavirus disease 2019 (COVID-19), in-person encounters in Medications for Opioid Use Disorder (MOUD) with buprenorphine treatment programs were not feasible. This study suggests telemedicine as an alternative to in-person meetings and is efficacious in retaining patients in MOUD with buprenorphine treatment programs during the COVID-19 pandemic.

Keywords: buprenorphine–naloxone, COVID-19, telemedicine, retention, Opioid Use Disorder

The novel coronavirus disease 2019 (COVID-19) is caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). This infectious disease has spread rapidly across the

globe in a span of a few months. On March 11, 2020, COVID-19 was declared a pandemic by the World Health Organization (WHO). The United States issued a proclamation declaring a national

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emergency concerning the COVID-19 outbreak on March 13, 2020 (Center for Disease Control and Prevention, 2020a). The Pennsylvania state Governor ordered an emergency stay-at-home for the entire state on March 16, 2020 (Commonwealth of Pennsylvania, 2020).

The COVID-19 pandemic comes when the United States is still grappling with the effects of the opioid epidemic. In the United States, overdose deaths from opioids, including prescription opioids, heroin, and synthetic opioids (like fentanyl), have increased almost six-fold since 1999 (Center for Disease Control and Prevention, 2020b). Opioids were involved in 46,802 overdose deaths (69.5% of all drug overdose deaths) in 2018 (Hedegaard et al., 2020). Two out of three (67.0%) opioid-involved overdose deaths involved synthetic opioids (Wilson et al., 2020). The total economic cost of the opioid crisis including healthcare, criminal justice, and employment costs was estimated to be \$504.0 billion by the Council of Economic Advisers (CEA) in 2015 (Campisi, 2020).

Hundreds of thousands of Americans rely on Medications for Opioid Use Disorder (MOUD) treatment programs for medications such as buprenorphine, methadone, or extended-release naltrexone, all of which are effective for the treatment of Opioid Use Disorder (OUD); (National Institute on Drug Abuse, 2016). These medications are essential medicines, so MOUD treatment programs must remain operational during the COVID-19 pandemic. A 2012 study concluded that even if buprenorphine-waivered clinicians prescribed at maximum capacity, approximately 1 million U.S. patients with OUD would still lack access to OUD treatment (Jones et al., 2015). The pandemic further complicated this lack of access because an emergency declaration of stay-at-home orders impeded patients' abilities to utilize treatment. In addition to this, individuals with Substance Use Disorder (SUD) are feared to be especially susceptible to COVID-19 (Volkow, 2020). Individuals with SUD, especially with OUD and African Americans, have an increased risk for COVID-19 and its adverse outcomes (Wang et al., 2021). A single-center emergency department study found that nonfatal opioid overdoses doubled during the early COVID-19 pandemic. African Americans accounted for a relatively larger proportion of opioid overdose visits compared to the previous year (Ochalek et al., 2020). Several changes were made in policies and regulations to overcome the

lack of treatment availability problems, including broader access to telemedicine. Telemedicine refers to the remote diagnosis and treatment of patients using telecommunications technology. Telemental health is effective across many populations and settings and appears to be comparable to in-person care (Hilty et al., 2013).

There are limited data on the delivery and efficacy of MOUD with buprenorphine using telemedicine alone. In a retrospective analysis, abstinence from other drugs and treatment retention rates were not statistically different in the telemedicine and face-to-face group-based medication management groups. However, telemedicine group patients attended face-to-face group therapy as well (Zheng et al., 2017). It is unknown if telemedicine alone would make a difference in treatment retention during the times of COVID-19. What is known is that long-term retention in MOUD treatment is associated with improved outcomes, and discontinuing medication often leads to relapse and overdose (Weiss et al., 2015).

Devising various strategies for treatment retention is essential (Chan et al., 2020). COVID-19 threatened retention rates by denying access to treatment. There is a widespread call to permanently reduce barriers to improve access and outcomes (Davis & Samuels, 2021). Buprenorphine prescribers quickly transitioned to provide telemedicine visits in high volume; nonetheless, there are still many unknowns, including the quality and safety of widespread use of telemedicine for OUD treatment (Uscher-Pines et al., 2020). A review of the extant literature did not identify any research examining the effects of COVID-19 on retention rates in MOUD and telemedicine's impact on these retention rates.

Method

Study Setting

This study was conducted at a rural Federally Qualified Health Center (FQHC) in south-central Pennsylvania that serviced approximately 56,000 patients, more than 60% patients from rural counties. The center provides MOUD with buprenorphine at Family Medicine Clinic, Women's Care Clinic, and Behavioral Health Clinic. Forty five percent patients in MOUD program are from rural counties. All clinical sites share electronic health record software for all

patients. All buprenorphine and buprenorphine–naloxone prescriptions are sent to pharmacies electronically from the patient’s electronic health record. Although these services are provided at different primary care clinical sites, MOUD providers follow the Academy of Addiction Medicine (ASAM) guidelines for assessment and treatment of OUD to maintain uniformity within MOUD with buprenorphine treatment program. Before COVID-19-related social distancing guidelines, all MOUD with buprenorphine clinic visits were face-to-face. All patients signed a buprenorphine agreement to comply with the program’s rules and regulations. Pennsylvania Prescription Drug Monitoring (PDMP) data were checked for every treatment program visit. All patients must submit urine samples for the drug screen at each MOUD with buprenorphine clinic visit. Urine drug tests are conducted on-site using a one-step multidrug screen test cup. This assay provides only a preliminary analytical test result using an immunoassay for the qualitative detection of multiple drugs. The provider receives the urine drug screen results prior to any face-to-face interaction with the patient. If a patient cannot submit a urine sample for a drug screen, a saliva swab is performed to collect samples for quantitative testing. Preliminary, qualitative test results are discussed with patients during patient–provider face-to-face interactions. It is left to the provider’s discretion to order quantitative analysis of the same urine sample if a discrepancy is detected in the patient’s self-report and qualitative test results. All samples for quantitative analysis are transported to an outside laboratory.

In our MOUD with buprenorphine treatment program, patients are usually seen at intervals of 1 week to 1 month, depending on their stage of recovery and evidence of absenteeism from drugs based on drug screen results. Buprenorphine and buprenorphine–naloxone prescriptions are written for amounts not to exceed a month’s supply. There are no refills provided for buprenorphine and buprenorphine–naloxone prescriptions. Individual psychotherapy is provided at the Center’s Behavioral Health and Family Medicine Clinic. Patients in MOUD with buprenorphine are referred to psychotherapy as an adjunct psychosocial treatment for OUD. New patients are accepted in MOUD with buprenorphine treatment program for assessment and treatment throughout the year. MOUD with buprenorphine treatment is discontinued based on the evidence

of dishonesty on the patient’s part and/or diversion of prescribed medications. Patients who drop out of the treatment due to lack of medical insurance, lack of transportation, incarceration, etc. are allowed to re-enroll in the program.

MOUD with buprenorphine clinic visits were transitioned to telemedicine due to COVID-19-related social distancing guidelines. All patients were informed via phone calls or text messages about this adjustment. The requirement of a drug screen for new and established patients is waived as per ASAM drug testing protocols (*American Society on Addiction Medicine COVID-19 Task Force, 2020*). Telemedicine services were fully functional at all clinical sites on April 1, 2020. Telemedicine services are delivered using a HIPAA compliant software program through audio–video or audio-only appointments.

Study Design and Measures

This study is a retrospective chart review. For all MOUD with buprenorphine patients, dates of the visits, progress notes, urine drug screen results (qualitative and quantitative), current and previous buprenorphine formulation, and dosage are recorded in the patients’ electronic health records. We extracted individual patient information, using Medication-Assisted Treatment (MAT), buprenorphine and buprenorphine–naloxone as search words, from the electronic health records database of all patients. Electronic health records were searched from July 1, 2019, to June 30, 2020, to identify active patients in treatment.

The patient was defined as an active patient in treatment only if buprenorphine or buprenorphine–naloxone prescriptions (minimum one prescription) were ordered and electronically sent to the pharmacies by Health Center’s MOUD providers. Data were divided into four groups of 3-months’ time points from July 1, 2019, to June 30, 2020, denoted by Groups 1–4 in consecutive order. Group 1 represented the number of active patients from July 1, 2019, to September 30, 2019; group 2 from October 1, 2019, to December 31, 2019; group 3 from January 1, 2020, to March 31, 2020; and group 4 from April 1, 2020, to June 30, 2020. Treatment retention is defined as the presence of an individual active patient in two consecutive groups. In our data, we have one in-COVID group from April 1, 2020, to June 30, 2020 (group 4), as data are collected till June 30, 2020, only. Group 2

(active patients from October 1, 2019, to December 31, 2019) served as a baseline for our MOUD with buprenorphine clinic treatment retention rate. Group 3 (termed pre-COVID presenting active patients from January 1, 2020, to March 31, 2020) is a time frame immediately before the pandemic hits our region.

We reviewed the electronic health records of patients identified in each group to confirm an active status during 3-months' time points. During that 3-months' time points, both new and established patients met the criteria for active patients as buprenorphine or buprenorphine-naloxone prescriptions were ordered and electronically sent to pharmacies by Health Center's MOUD providers for these patients. The treatment retention rate was calculated by comparing the number of active patients who retained in consecutive groups of 3-months' time points, that is, July 1, 2019–September 30, 2019 (Group 1) versus October 1, 2019–December 31, 2019 (Group 2); October 1, 2019–December 31, 2019 (Group 2) versus January 1, 2020–March 31, 2020 (Group 3); and January 1, 2020–March 31, 2020 (Group 3) versus April 1, 2020–June 30, 2020 (Group 4).

Our local Institutional Review Board approved the study protocol as an exempt review. A waiver of Health Insurance Portability and Accountability Act (HIPAA) authorization to release the Protected Health Information (PHI) was reviewed and approved for this research study.

The Substance Abuse and Mental Health Services Administration (SAMHSA) recently adopted the term "Medications for Opioid Use Disorder" (MOUD) to replace "Medication-Assisted Treatment" (MAT). At our clinic, MAT is used to label clinic visit progress notes in the patient's electronic health records. MAT was used as search terminology along with buprenorphine and buprenorphine-naloxone to identify active patients. Otherwise, throughout the article, the term "MOUD with buprenorphine" is used.

Statistical Analysis

The primary outcome measure is the treatment retention rate of patients in MOUD with buprenorphine treatment program, defined as the percentage of patients still in care during 3-months' time points compared to the 3-months' time points of equal duration immediately preceding it. Confidence level was kept as 95%. Confidence

intervals were calculated using the UCSF-CTSI confidence interval for a proportion calculator tool (Kohn & Senyak, 2021). Total number of active patients and retained patients for 3-months' time points were used to calculate the proportion, upper and lower bound of confidence interval.

Results

Total numbers of active patients identified in the study's four groups were 309, 327, 360, and 365, respectively (Figure 1). A number of patients retained in the treatment in consecutive groups of 3-months' time points are 286, 308, and 327. The percentage of patients retained in treatment in consecutive groups of 3-months' time points are 92.55%, 94.18%, and 90.83% with the 95% confidence intervals of treatment retention being [0.896, 0.956], [0.916, 0.967], [0.878, 0.938], respectively.

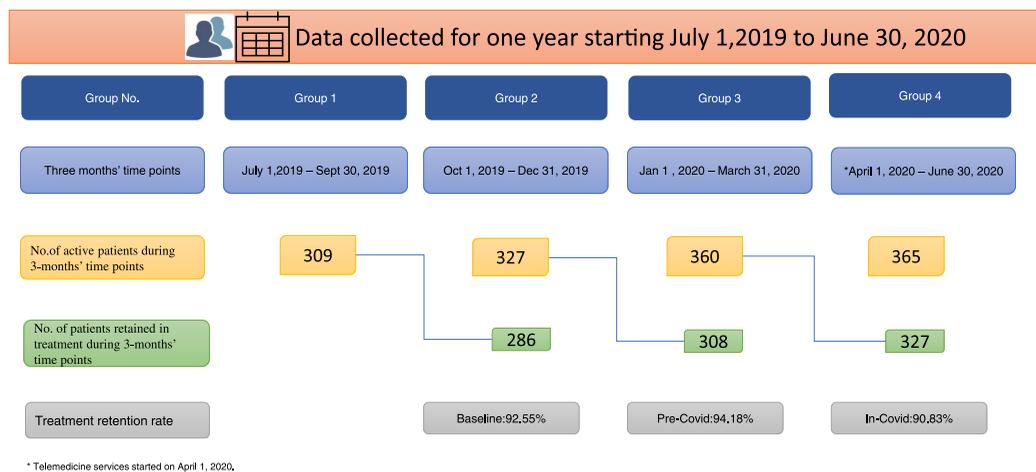
Discussion

This study reviewed the impact of telemedicine on MOUD with buprenorphine treatment retention rates in the times of COVID-19. There is a perception that telemedicine services are promising in retaining patients in MOUD with buprenorphine treatment programs. Percentage of treatment retention rates of in-COVID group were 90.83% [0.878, 0.938] compared to 94.18% [0.916, 0.967] retention rates of pre-COVID group. Retention rates in MOUD treatment programs vary within the range of 19%–94% at 3-months (Timko et al., 2016). In our sample, telemedicine service is efficacious in retaining patients in MOUD with buprenorphine.

COVID-19 pandemic has challenged almost all medical treatment delivery systems. Individuals with OUD have been a vulnerable population during these times. Several considerations have been offered on how pandemic can affect persons with OUD. These include problems with access to treatment, drug effects on the immune system and respiratory drive, disruption of illicit markets resulting in problem behaviors, and increased stress and anxiety as a precursor to cravings and consumption (Spagnolo et al., 2020).

One of the measures used for the success of MOUD programs is treatment retention rates. The great majority of patients who initiate buprenorphine are not successfully retained in care (Timko et al., 2016). Retention in MOUD treatment is

Figure 1
Pictorial Representation of Study Data



Note. See the online article for the color version of this figure.

affected by multiple factors, such as accessibility to treatment, medical insurance coverage of visits and medications, need for transportation, frequency of visits, the requirement of intensive drug and alcohol therapy, need for the absence from work due to treatment or therapy visits, physician–patient relationship, therapist–patient relationship, and need for abstinence from licit and illicit drugs of abuse, are to mention a few. Treatment discontinuation is associated with an increased risk of adverse outcomes, including overdose, ER visits, and hospitalization (Williams et al., 2020). Because of social distancing, ensuring patient retention in these programs is a challenging task that was put to a more significant test during the pandemic.

To address the above challenges, on March 17, 2020, the Center for Medicare Services (CMS) broadened access to Medicare telehealth services so that beneficiaries could receive continuous care (Lee et al., 2020). The Pennsylvania Office of Mental Health and Substance Abuse Services (OMHSAS) guided telemedicine's rapid implementation. Given the Centers for Disease Control and Prevention's (CDC) recommendations related to quarantine and isolation, both self-imposed and mandatory, OMHSAS announced a preference for the use of telehealth as a delivery method for medically necessary behavioral health services and temporarily suspended the specific requirements that govern the provision of behavioral health services using telehealth. The

Department of Health and Human Services (HHS) waived penalties for using non-HIPAA compliant video conferencing software, and the Office of Civil Rights (OCR) released guidance about this waiver (US Department of Health & Human Services, 2020). They have allowed telephonic video technology to deliver care, commonly available on smartphones and other electronic devices. In addition, telephone-only services were allowed to be utilized in situations where video technology was not available.

Drug Enforcement Administration (DEA) has been closely following the situation, implementing the rules related to the controlled substances (Whaibeh et al., 2020). They lifted the Ryan Height Act requirements that healthcare professionals conduct an initial, in-person examination of a patient before electronically prescribing a controlled substance (DEA, 2020). Amidst the COVID-19 crisis, on March 20, 2020, ASAM released updated national practice guidelines for treating OUD. It contained 13 new recommendations and major revisions to 35 existing recommendations (Crotty et al., 2020). These interventions were especially critical in the context of the ongoing COVID-19 emergency, which threatens to curtail patient access to evidence-based treatment.

The primary strength of our study is the total number of active patients in each group. Patients established in MOUD with buprenorphine treatment program transitioned to telemedicine

without any obstacles. There was no change in providers at all clinical sites delivering MOUD with buprenorphine treatment services throughout the study year. This allowed a more accurate comparison between groups without an extra confounding factor to control for.

This study had a small number of limitations. This is a retrospective chart review, and the data were collected as part of the patient's electronic health records before the inception of this study. Clinical sites in this study serve primarily rural populations, and therefore, it could be difficult to generalize the results to the general treatment population. A high baseline retention rate of 94% could paradoxically be an issue. It reflects the high quality of service and a stable functioning agency. However, results from this study may not be generalizable to other MOUD with buprenorphine providers. We have not analyzed all the variables that may affect treatment retention, for example, the number of new patients in each group. Drug screen samples were not collected due to COVID-19-related social distancing guidelines.

When delivering treatment MOUD with buprenorphine at a distance, one may worry about treatment compliance, diversion of medications, and relapse; without being identified promptly. Clinicians should use their judgment factoring in patient-specific risk-benefit profiles in these situations. However, in general, the risk of a patient overusing or diverting MOUD, such as buprenorphine, is outweighed by the danger of relapse and death by overdose if they drop out or are out of medication.

To further address the above and improve the quality of service, treatment providers could implement procedures to monitor patients for compliance with treatment and identify relapse. Drug testing options at a distance, such as oral fluid-based tests and home breathalyzer tests monitored via telehealth, are recommended. Video monitoring of patient's intake of medication during a telemedicine visit, frequent follow-up visits, and involving the patient's family members in the treatment plan can improve treatment adherence. Prescribing Narcan and educating patients/family members about the Narcan in an opioid overdose could prevent fatal overdose outcomes.

Conclusions

Our study suggests that telemedicine is efficacious in retaining patients in MOUD with

buprenorphine treatment programs during the COVID-19 pandemic. Telemedicine is an effective alternative to face-to-face treatment delivery for MOUD with buprenorphine treatment. During the need for social isolation and social distancing, it could be considered an alternative to in-person encounters. Telemedicine is a necessary service and needs to be available after this pandemic as well.

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