

Impact of a Pharmacist-Led Telehealth Intervention on Medication Adherence for Patients with Substance Use Disorder in a Rural Community Pharmacy

Janice T. Nguyen, PharmD¹; Scott M. Sexton, PharmD²; Jonni Williams, PharmD³

¹ Corewell Health Family Medicine, Lake Odessa, Michigan

² UNC Eshelman School of Pharmacy, Chapel Hill, North Carolina

³ Family Health Care, Grant, Michigan

Abstract

Background

Substance use disorder has significantly affected the lives of individuals throughout the United States. Pharmacists are well-positioned to assist with medication adherence and other medication-related problems related to substance use disorder treatment. With virtual care becoming readily available, telehealth helps patients to achieve the care they need and helps to overcome the barriers to accessing in-person patient appointments.

Objective

To assess the impact of a pharmacist-led telehealth intervention on medication adherence for patients with substance use disorder currently enrolled in a treatment program. The secondary objectives were to evaluate patient relapse rates and determine overall patient satisfaction with pharmacist-driven telehealth services.

Methods

The pharmacist-led telehealth program held up to 5 monthly appointments with patients who were seeing a physician for treatment of substance use disorder. Following these appointments, data related to medication adherence, relapse rates, social determinants of health, and patient satisfaction were collected.

Results

Six patients enrolled in the substance use disorder telehealth service and completed at least one appointment. Five of these patients completed the full program. A majority of these patients were being treated for opioid use disorder and were taking suboxone. Five of the six patients met adherence goals of 80-100%, with all patients improving adherence from their first visit to their last visit.

Conclusion

The implementation of a pharmacist-led intervention of support services for patients with substance use disorder improved medication adherence. The pharmacists were able to address additional issues such as side effects, social determinants of health, and medication cost at these telehealth appointments.

Keywords: substance use disorder, telehealth, rural, adherence, medication

Background

Substance use disorder (SUD) has impacted the lives of many across the United States. It can have social, psychological, and physical effects that impact daily life, and can lead to increased morbidity, mortality, and economic burdens.¹ In recent years, the prevalence of substance use has been on the rise, highlighting the need for SUD treatment.²

There are multiple treatment strategies for patients with SUD, including medication management of withdrawal symptoms and for suppression of cravings, and behavioral therapy used in combination with medications. In the US in 2023, 17.1% of the population met the criteria for having a type of SUD within the past year.³ This included 27.1% of adults age 18–25, and 16.6% of adults age 26 or older—only 4.7% and 4.5% of whom, respectively, sought any type of SUD treatment.³ It is estimated that 40–60% of patients receiving medication assisted treatment relapse within the first year.⁴

Corresponding Author:

Scott Sexton

UNC Eshelman School of Pharmacy

301 Pharmacy Lane

Chapel Hill, NC, 27599

smsexton@unc.edu

(618) 340-0269

According to the 2020 Census, about 20% of the US population lives in a rural area.⁵ The Health Resources and Services Administration (HRSA) defines rural areas as non-metropolitan counties or outlying metropolitan counties with no population from an urban area of 50,000 or more people.⁶ The Census Bureau simplifies this definition to “any population, housing,

or territory NOT in an urban area.” In Michigan, about 18% of the state’s population resides in a rural area.^{7,8} In rural communities, the closest healthcare facility for primary care is often located miles away and not easily accessible. Barriers to accessing proper healthcare, such as an inability to travel, can be a major burden for patients in these areas. With limited access to healthcare, patients may experience medication problems, such as poor medication adherence.⁹

Many rural health patients struggle financially. In 2022, the Michigan Substance Use Vulnerability Index reported that 29.4% of Michigan residents lived 150% below the poverty line.¹⁰ Individuals living in low-income areas are likely to experience poorer health outcomes. Social determinants of health (SDOH) are defined as “the conditions in the environments where people are born, live, learn, work, play, worship, and age that affect a wide range of health, functioning, and quality-of-life outcomes and risk.”¹¹ According to the 2019 American Community Survey, nonmetro (rural) poverty rates were 15.4% compared to 11.9% for metro areas.¹² The rural population faces issues in housing, transportation, food, and more that can negatively impact their overall health, and low-income individuals have a higher prevalence for SUD; together, these factors increase the risk of relapse.¹³

The COVID-19 pandemic encouraged healthcare systems to limit contact exposure as much as possible to avoid spreading the virus. During the pandemic, 40.9% of patients avoided or delayed care and had limited access to care.¹⁴ Additionally, 6.1% of patients experienced delays in obtaining their prescriptions, and 5.2% were unable to access care, resulting in moderate or severe impact on their health.³ To protect both healthcare workers and patients, healthcare systems increased the use of virtual care. According to the Substance Abuse and Mental Health Services Administration (SAMSHA), 11.9% of patients with SUD had their appointments transition from in-patient to virtual telehealth. With virtual care becoming readily available, telehealth helped patients access the care they needed.

Pharmacists are well-positioned to assist with care for patients and, among patients, community pharmacists are some of the most trusted healthcare professionals. Pharmacists are easily accessible to the public, with 90% of US residents living within five miles of a community pharmacy; this proximity is in contrast to what many patients face in trying to access primary care.¹⁵ Pharmacists provide care to patients by mitigating medication costs, assisting with medication side effects, providing medication education, and serving as a resource for those who may be struggling with SUD.¹⁶

A study by Smith, Hansen, and Colvard evaluated the impact of a pharmacist-led telephone clinic for patients with opioid disorder and alcohol use disorder (AUD) to help them manage their medication treatment. This study demonstrated that

there were “statistically and clinically significant improvements in retention rates” of medication treatment for substance use and alcohol use.¹⁷

The need for pharmacist involvement in providing care for patients with SUD is evident. The purpose of this study was to create a pharmacist-led SUD support service, via telehealth, to improve medication-related outcomes for our patients.

Practice Description

The study was conducted at a Federally Qualified Health Center (FQHC) that services three counties in rural Michigan. The study was funded by a Michigan Health Endowment Fund grant that limited the telehealth services to an FQHC. The FQHC at which the study was conducted houses and provides pharmacy, medical, vision, and dental services within one building.

The pharmacy within the FQHC is open to the public. Patients do not have to see a medical, vision, or dental provider to fill their prescriptions in the pharmacy. If patients do see providers at the clinic, they have the option to attend appointments and pick up prescriptions during the same visit.

Objectives

The primary objective of this study was to assess the impact of a pharmacist-led telehealth intervention on medication adherence for patients with SUD who are currently enrolled in a Medication for Opioid Use Disorder (MOUD) or AUD program.

The secondary objectives were to evaluate patient relapse rates and patient need for SDOH supports, and to determine overall patient satisfaction with pharmacy telehealth services. This study was submitted to the Institutional Review Board (IRB) and determined to be non-human subject research.

Methods

The pharmacist-led telehealth program held appointments from October 2022 through May 2023. Two pharmacists dedicated eight hours per week to the program. Patients were included in the study if they were currently enrolled in an SUD treatment program with a provider within the FQHC system who was authorized to provide SUD services. Patients were excluded from the study if they were not currently seeing our FQHC SUD providers or if they were not currently enrolled in an SUD treatment program. A list of eligible patients was obtained from the pharmacy’s data analyst, who pulled reports based on the eligibility criteria.

The patient enrollment period was held for two months prior to the service implementation. The pharmacists began by contacting patients via phone call, with a total of five outreach attempts. Patients who were not reached after five attempts were no longer contacted. At the time of communicating with each patient, the pharmacists documented whether the

patient decided to participate. When a patient enrolled in the program, they signed a consent form to participate in the service.

Patients who enrolled in the program attended five total appointments, via telehealth, with one or both pharmacists, who provided the service at no charge. During these appointments, which were 30–60 minutes in duration, the pharmacist discussed various topics, including medication counseling, side effect management, supports to assist with SDOH, and other health-related needs. Patients who were uncomfortable with virtual visits were invited to the pharmacy for in-person visits.

Each monthly appointment included a survey conducted through QuestionPro, an online survey software. If patients needed help to access the internet, internet boosters were available from the pharmacy team. QuestionPro utilized a password protected login with de-identified patient information. During the first visit, a background survey was administered to assess prior substance use, patient relapse history, treatment and recovery goals, and mental health screenings, and to screen for a history of trauma or abuse. Additionally, patients were asked if they needed assistance with housing, finances, food, and other barriers to care.

At each follow-up appointment, a telehealth visit questionnaire was administered and documented in QuestionPro and the pharmacy's electronic health record. The data collected regarding medication adherence and patient appointment dates were kept in a password-protected Excel spreadsheet accessible only to the two pharmacists working with the patients. To gather medication adherence information, data were pulled through the pharmacy's prescription processing system and the Michigan Prescription Drug Monitoring Program. For patients who did not fill at our pharmacy, phone calls were made to their primary pharmacy to verify prescription pick up-dates.

To analyze the medication adherence data, a medication possession ratio was calculated by taking the days supply of the medication dispensed divided by the days the medication was possessed by the patient. The calculation for each patient's medication adherence was conducted once monthly, starting from one month prior to the patient's first telehealth appointment, and this initial calculation was used for comparison after the intervention period began. The monthly adherence calculations were utilized to track progress, with a medication adherence goal of 80–100% for each patient.

To measure patient satisfaction and relapse rates, the QuestionPro surveys asked patients to rate their satisfaction from "strongly disagree" to "strongly agree" utilizing a five-option Likert scale. Patients were given multiple questions to respond to, focusing on telehealth benefits, desire to continue the telehealth appointments, and feeling like the pharmacy

team cared about their health. For relapse rates, patients were asked "yes or no" questions about relapses within the past year, with relapse being defined as "return to baseline use of substance." The patient satisfaction surveys were not given at the first meeting, but were given at each subsequent appointment.

Results

Following the recruitment period, we determined that 37 patients were eligible for enrollment. Of these, 21 expressed interest, and 12 enrolled into the program. Of these 12, six completed at least one questionnaire and one patient appointment, for a total of 26 appointments within the patient appointment period. The patients were ages 30–40, with four being female and two being male. All patients reported being of low-income status. One of the six patients relapsed and was lost to follow-up after the first appointment; the other five fully completed the program.

Participants were asked which substance(s) they were receiving treatment for (**Table 1**) and which medications they were using for that treatment (**Table 2**). Four patients were receiving treatment for using prescription opiates or using multiple substances together; two were receiving treatment for alcohol use. Each patient was receiving care from the same substance use provider, which allowed the pharmacists to easily communicate with the provider regarding the patients they were treating.

Table 1: Type of Substance Used in the Past

Substance	# of patients
Prescription opiates or heroin	4
Alcohol	2

Table 2: Medication used for substance use disorder

Medication	# of patients
Suboxone	4
Disulfuram	1
Vivitrol	1

Patient Satisfaction

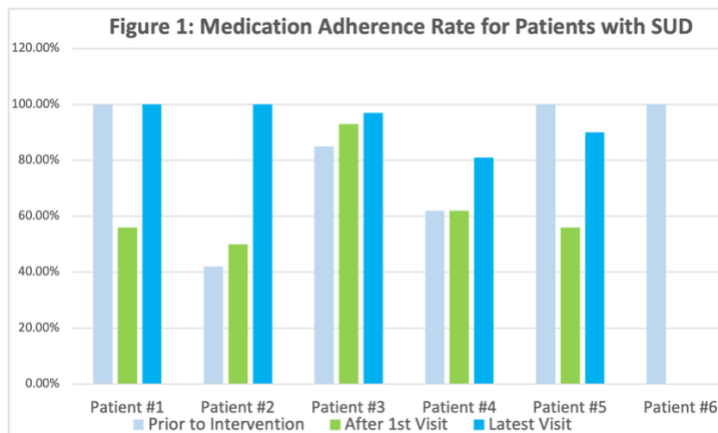
Patient satisfaction was assessed at each visit, with a total of 18 responses (with the exception of one statement having 17 responses due to a patient missing the question). Notably, patients indicated that they strongly agreed or agreed that they wanted to continue telehealth visits on 94.45% of the responses, including the final questionnaire of the program after patients had finished with the initial enrollment period. Satisfaction data collected are provided in **Table 3** on page 7.

Relapse Rates

Of the six patients who enrolled in the program, one relapsed to prior baseline use of substance; 83.33% of patients maintained recovery at the end of the study. The one patient relapsed after the initial appointment and was not able to be reached for follow-up or assistance.

Medication Adherence

Each patient started off at baseline with a medication adherence rate of 40–100%, with some patients having decreased adherence after the first visit. At the conclusion of the study, each patient who completed the full program showed improved adherence when compared to their first visit, with all patients who completed the program being above an 80% adherence rate. By the end of the program, each patient's medication adherence met this study's goal, except for the patient who was lost to follow-up. Data from medication adherence can be found in **Figure 1**.



Qualitative Findings of Social Determinants of Health

The data taken from the surveys at each patient's appointment demonstrated various SDOHs that hindered their ability to receive care. Every patient who completed the program had at least one SDOH that the pharmacist could help address at their appointments. The pharmacists were able to identify patient needs for housing, financial, travel, and prescription copay assistance.

Discussion

This study was able to identify multiple SDOHs that impacted medication adherence rates. Both pharmacists identified that each patient had a different type of barrier that impacted their care and the management of their treatment.

For patients #1 and 2, the pharmacists were able to provide copay assistance, saving over \$200 per month. For patients #3–6, the pharmacists were able to provide community resources for housing, financial aid, food, and travel. For patients #3 and 4, the pharmacists helped address medication-related issues such as side effects and affordability.

Anecdotally, a significant finding in this study was that two of the six patients who completed the program were able to completely wean off their controlled substance medications and are now sustaining abstinence from substance use.

Some notable patient quotes from the satisfaction surveys include "I feel like I got more time to talk about what I was experiencing with side effects with the medicine to you than I did with my doctor appointments. You guys helped me with every problem with my side effects" and "It made things much smoother and more efficient, and it covered a wide range of things not discussed in normal doctor appointments (prescription costs, insurance issues, overall concerns and life problems). It helped to talk to somebody about everything that is going on."

While conducting this study, the pharmacists identified that it would be beneficial to have a referral process in which care managers and pharmacists could collaborate to address patient treatment barriers that can impede medication adherence. It may also be beneficial to consider training pharmacists or pharmacy technicians as care managers to help assist with SDOH issues. These changes could help pharmacy teams assist in increasing medication adherence, with the end goal of patients no longer needing medications to abstain from substance use.

The primary limitation of the study was that the service was restricted to only three counties, which only included one of the FQHC locations. This limitation was due to the funding process, which was focused on a three-county region. One location outside of this three-county area and within the FQHC organization had a higher number of patients with SUD. If this county and location had been included in the study, it may have increased the patient enrollment for the service. One of the FQHC locations did not have a pharmacy within the building, so many patients at this location did not fill prescriptions directly with our organization, limiting our ability to comprehensively monitor medications of these patients. There are plans to implement a new pharmacy at this location, which will benefit the organization and help bridge gaps in care.

Another limitation was the small number of SUD providers located within the three counties and authorized to treat for opioid use disorder. This limited patient access to care by requiring many patients to travel longer than 15 minutes to appointments. Having only two eligible providers may have greatly limited the number of SUD patients that could be seen. Provider shortage is a common issue in rural areas, with patients sometimes having to travel more than an hour for care. With telehealth, patients can minimize travel issues and attend appointments without worrying about how to get to and from their appointments. Additionally, on January 12, 2023, it was announced that the X-DEA waiver would no longer be required to treat patients with opioid use disorder.

This has removed a significant barrier for patients seeking treatment for substance use.

Following the completion of the grant-funded service, the pharmacy team was able to assess the sustainability of the program by utilizing the next pharmacy resident and dedicating 2–4 hours a week for patient care learning experiences. They've continued to offer the program as a service, and will be expanding it to all locations within the FQHC organization. Future pharmacy residents will take on the project of providing telehealth services to our patients.

The pharmacists found that five of the six patients verbally expressed interest in continuing services with the pharmacists following the conclusion of their five monthly appointments. As the program is further established, we believe that the number of patients referred to the program by our providers and partners will increase. We believe that a study with a larger sample size over multiple sites will provide robust evidence that supports the success of this pilot project.

This study suggests that increased pharmacist involvement in providing support services, including SDOH, to patients with MOUD and AUD will increase patient adherence and increase the number of patients maintaining recovery from SUD.

Conclusion

The implementation of pharmacist-led support services for patients with SUD improved medication adherence. At these telehealth appointments, the pharmacists were able to address additional issues such as side effects, social determinants of health, and medication cost. Such concerns were not previously addressed at patients' SUD appointments, and beginning to address them favorably impacted medication adherence. Overall, patients were extremely satisfied with the service and agreed to continue it after the end of the program.

Acknowledgements: This project would not have been possible without the willingness and dedication to patient care of the Baldwin Family Health Care organization.

Funding Statement: This project was funded by the Michigan Health Endowment Fund.

Conflict of Interest Statement: None of the authors declare any conflicts of interest or financial interest in any product or service mentioned in this article.

Treatment of Human Subjects: IRB determined project was non-human subjects research.

References

1. Wu LT. Substance abuse and rehabilitation: Responding to the global burden of diseases attributable to substance abuse. *Subst Abuse Rehabil*. 2010 Oct;2010(1):5-11. doi: 10.2147/SAR.S14898.
2. National Center for Drug Abuse Statistics. Drug Abuse Statistics. National Center for Drug Abuse Statistics. Accessed April 4, 2025. <https://drugabusestatistics.org/>
3. Substance Abuse and Mental Health Services Administration. (2024). *Key substance use and mental health indicators in the United States: Results from the 2023 National Survey on Drug Use and Health* (HHS Publication No. PEP24-07-021, NSDUH Series H-59). Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration. <https://www.samhsa.gov/data/report/2023-nsduh-annual-national-report>. Accessed February 6, 2025.
4. NIDA. Treatment and Recovery. National Institute on Drug Abuse website. <https://nida.nih.gov/publications/drugs-brains-behavior-science-addiction/treatment-recovery>. March 9, 2023 Accessed June 30, 2023.
5. United States Census Bureau. Nation's urban and rural populations shift following 2020 Census. December 29, 2022. Accessed on June 30, 2023. <https://www.census.gov/newsroom/press-releases/2022/urban-rural-populations.html#:~:text=The%20rural%20population%20%E2%80%94%20the%20population,2010%20to%2020.0%25%20in%202020>.
6. Health Resources and Services Administration. What is Rural? U.S. Department of Health and Human Services. Accessed April 4, 2025. <https://www.hrsa.gov/rural-health/about-us/what-is-rural>
7. United States Census Bureau. Rural America <https://mtgis-portal.geo.census.gov/arcgis/apps/MapSeries/index.html?appid=49cd4bc9c8eb444ab51218c1d5001ef6>
8. Rural Health Information Hub. Michigan. Updated April 20, 2022. Accessed on June 30, 2023. <https://www.ruralhealthinfo.org/states/michigan>
9. Espeland S, LanzDuret-Hernandez J, Grajdura S, Rowangould D. (2024). Evaluation of rural travel constraints and travel burdens in the U.S. and in rural zero-car households. UC Davis: National Center for Sustainable Transportation.
10. CDC SVI Citation: Centers for Disease Control and Prevention/ Agency for Toxic Substances and Disease Registry/ Geospatial Research, Analysis, and Services Program. CDC/ATSDR Social Vulnerability Index 2020 Database Michigan. https://www.atsdr.cdc.gov/placeandhealth/svi/data_documentation_download.html. Accessed on June 30, 2023.
11. U.S. Department of Health and Human Services. Social determinants of health. Healthy People 2030. Published 2020. Accessed on September 8, 2023. <https://health.gov/healthypeople/priority-areas/social-determinants-health>
12. Farrigan T. USDA ERS — Rural poverty & well-being. Economic Research Service — U.S. Department of Agriculture. Updated September 8, 2023. Accessed on

- September 8, 2023.
<https://www.ers.usda.gov/topics/rural-economy-population/rural-poverty-well-being/>
13. Poverty and Health — The Family Medicine Perspective (Position Paper). American Academy of Family Physicians website. <https://www.aafp.org/about/policies/all/poverty-health.html>. Accessed on June 30, 2023. (7)
 14. Czeisler M, Marynak K, Clarke KEN, et al. Delay or avoidance of medical care because of COVID-19-related concerns — United States, June 2020. *MMWR Morb Mortal Wkly Rep.* 2020;69(36):1250-1257. Epub 2020/09/12. doi: 10.15585/mmwr.mm6936a4
 15. Jasinski M, Lee L, Dorsey S, et al. A national study of pharmacist-provided immunization services in rural areas. *J Am Pharm Assoc (2003)*. 2022;62(2):451-458. doi:10.1016/j.japh.2022.03.015.
 16. Gbekte, M. Caliendo, T. Assessing substance use disorder in pharmacy practice. *US Pharm.* 2022;47(7):41-44. Accessed on June 30,2023. <https://www.uspharmacist.com/article/assessing-substance-use-disorder-in-pharmacy-practice>.
 17. Smith A, Hansen J, Colvard M. Impact of a pharmacist-led substance use disorder transitions of care clinic on postdischarge medication treatment retention. *J Subst Abuse Treat.* 2021;130:108440. doi:10.1016/j.jsat.2021.108440

Table 3: Patient Satisfaction with Telehealth Services

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
"The telehealth visit covered important information" (n=18)	83.33%	11.11%	5.56%	0%	0%
"The telehealth benefitted me" (n=18)	77.78%	22.22%	0%	0%	0%
"The telehealth visit covered different information than my in-person appointments" (n=18)	77.78%	22.22%	0%	0%	0%
"I felt that I was heard during my telehealth visit" (n=18)	77.78%	22.22%	0%	0%	0%
"I felt that the pharmacist truly cares about my treatment during this telehealth visit" (n=18)	83.33%	16.67%	0%	0%	0%
"I feel like I have additional support with the telehealth visit" (n=18)	83.33%	16.67%	0%	0%	0%
"My concerns were addressed at the telehealth visit" (n=18)	66.67%	33.33%	0%	0%	0%
"The length of the time of the telehealth visit worked well for me" (n=18)	66.67%	22.78%	5.56%	0%	0%
"There was more information I wish we could have covered at my telehealth visit" (n=17)	0%	0%	5.88%	23.53%	70.59%
"I would like to continue with telehealth visits" (n=18)	66.67%	27.78%	5.56%	0%	0%
"The telehealth software was easy to use" (n=18)	61.11%	33.33%	5.56%	0%	0%