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Comparison of 30-day retention in treatment among patients referred to opioid use disorder treatment from emergency department and telemedicine settings

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ABSTRACT

Introduction: Telemedicine is a feasible alternative to in-person evaluations for people with opioid use disorder (OUD). The literature on medications for opioid use disorder (MOUD) telemedicine has focused on ongoing OUD treatment. Emergency department (ED) visits are an opportunity to initiate MOUD; however, little is known regarding the outcomes of patients following telemedicine referrals for MOUD from emergency settings. The current study describes rates of initial outpatient clinic appointment attendance and 30-day retention in care among patients referred by telemedicine compared to ED referrals.

Methods: This paper reports a retrospective review of data for patients referred from EDs or telemedicine through the Medication for Addiction Treatment and Electronic Referrals (MATTERS) Network. The MATTERS online platform collects data on patient demographic information (e.g., age, gender, race/ethnicity, and insurance type), reason for visit, prior medical and mental health history, prior OUD treatment history, and past 30-day substance use behaviors. Analyses compared initial visit attendance and 30-day retention among the patients for whom follow-up data were received from clinics by demographic and initial treatment factors.

Results: Between October 2020 and September 2022, the MATTERS Network made 1349 referrals; 39.7 % originated from an ED and 47.8 % originated from telemedicine. For patients with available data, those referred from telemedicine were 1.64 times more likely to attend their initial clinic appointment and 2.59 times more likely be engaged in treatment at 30 days compared to those referred from an ED. More than two-thirds of patients referred from the emergency telemedicine environment followed up at their first clinic visit and more than half of these patients were still retained in treatment 30 days after referral.

Conclusions: The rates of initial clinic visit and 30-day retention when referred following a telemedicine evaluation are encouraging. Further development of telemedicine programs that offer evaluations, access to medications, and referrals to treatment should be considered.

1. Introduction

Medications for opioid use disorder (MOUD), such as buprenorphine are lifesaving, evidence-based, outpatient treatments for opioid use disorder (OUD). An emergency department (ED) visit potentiates an opportunity to initiate MOUD for patients in crisis from OUD (Sharfstein, 2017). National guidelines support MOUD initiation in the ED (SAMHSA, 2021) and the literature describes multiple programs for ED-initiated buprenorphine (Bogan et al., 2020; D'Onofrio et al., 2017; Herring et al., 2019; Kaczorowski et al., 2020; Klein et al., 2019; Srivastava et al., 2019; Thomas et al., 2022).

The Medication for Addiction Treatment and Electronic Referrals (MATTERS) Network is one such program that facilitates ED-initiated buprenorphine treatment though a system of linked hospital and community prescribers (Clemency et al., 2022). MATTERS supports ED clinicians in their efforts to provide buprenorphine and timely referrals to an affiliated community of buprenorphine service providers in their area. MATTERS has expanded to include referrals from other, less

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traditional care environments, including correctional facilities, community outreach teams, homeless outreach teams, emergency medical, police, fire services, and telemedicine evaluations.

Emergency telemedicine offers a way to deliver urgent medical care remotely using video conferencing or phone consultations (Sikka et al., 2019). This differs from traditional emergency departments by providing immediate access to a healthcare professional without a physical visit. In the context of opioid use disorder, emergency telemedicine consultations can act as a bridge clinic (Taylor et al., 2023). Here, patients can connect with an emergency medicine trained provider who can assess their situation, screen for life threatening emergencies that warrant an in-person evaluation, prescribe treatment to manage withdrawal symptoms and cravings, and then refer them to long-term addiction treatment programs for ongoing support.

In recent years, telemedicine has emerged as a feasible alternative to in-person evaluations and interventions for both episodic and long-term care (Allen et al., 2020; Benz et al., 2021; Mahmoud & Vogt, 2019). The challenges of the COVID-19 pandemic necessitated the rapid growth in telemedicine throughout health care, including for treatment of patients with substance use disorder (SUD) (Perrin et al., 2020). Telemedicine was bolstered in 2020, when the Secretary of Health and Human Services waived the requirement for clinicians to perform an in-person evaluation prior to prescribing buprenorphine (Knopf, 2020). To date, much of the telemedicine MOUD literature has focused on ongoing OUD treatment. Less is known regarding the outcomes of patients following telemedicine referrals for MOUD from emergency settings.

In mid-2020, the MATTERS Network partnered with the University at Buffalo Department of Emergency Medicine Telemedicine division to provide emergency telemedicine assessments to those seeking care for OUD. The MATTERS emergency telemedicine care team of physicians, nurse practitioners, and physician assistants, who are board certified in emergency medicine, prioritize access to buprenorphine through a telemedicine protocol. The MATTERS team delivers focused, non-stigmatized care to patients in the comfort of their own home or other environments while minimizing gaps in medication. MATTERS emergency telemedicine can be accessed directly by individuals seeking help via a 24-hour hotline in parts of New York State and through the MATTERS mobile application or website (mattersnetwork.org) for other portions of New York State. The hotline is advertised on social media and traditional media (e.g., billboards). Referral sites may also initiate an emergency telemedicine evaluation on the individual's behalf.

Initial stabilization is critical but not sufficient for patients in crisis from OUD. An infrastructure which facilitates follow up and continued engagement is key for long term recovery. The goal of this study was to describe rates of initial outpatient clinic appointment attendance and 30-day retention in care among patients referred through the MATTERS Network by telemedicine in comparison to ED referrals.

2. Methods

This was a retrospective review of data for patients referred from EDs or telemedicine through the MATTERS Network. All data were initially obtained for clinical or quality improvement purposes. The study of this limited quality improvement dataset received a determination of non-human subjects research by the University of Buffalo Institutional Review Board.

The MATTERS Network includes over 200 referral sites (EDs, correctional facilities, emergency service organizations, etc.), a single emergency telemedicine program, and 240 affiliated SUD treatment clinics. MATTERS provides guidance, a framework, and a standardized dosing model for low threshold buprenorphine prescription that can be used in a variety of emergency settings. The MATTERS Network facilitates referrals through the Health Commerce System, a secure online platform hosted by the New York State Department of Health. This allows 24/7 access for clinicians, in collaboration with patients, to select a date and clinic location for short term follow-up. Patients select the treatment organization they prefer, and most clinic appointments are scheduled within 48 to 72 h. The program strongly recommends a standardized 14-day buprenorphine bridge prescription to ensure uninterrupted MOUD during the transition to clinic care.

Information collected by the online platform includes patient demographics (e.g., age, gender, race/ethnicity, and insurance type), reason for visit, prior medical and mental health history, prior OUD treatment history, and past 30-day substance use behaviors. Information is also gathered on whether the patient requested follow-up from a local peer support organization, whether the patient received a buprenorphine bridge prescription, and if so, for what dosage and duration, and whether the patient received a naloxone kit at the time of referral.

As part of ongoing quality improvement efforts, the MATTERS team requested patient follow-up data from a convenience sample of clinics that received the most referrals from EDs and telemedicine. The team requested data regarding initial clinic visit attendance and 30-day retention using a secure file transfer system through which the MATTERS program and clinic staff could communicate identifiable patient health information. The team asked clinic staff to query medical records for patients that had been previously referred to clinics in response to a single question: “Was patient still following up with you 30 days [after their initial referral]?” Fixed response options included “Patient never showed up”, “Patient was no longer coming to the clinic”, “Patient was still coming to appointments,” “We never got the referral”, and “We referred the patient elsewhere.” For patients who were referred elsewhere, additional follow-up was completed to assess whether they attended their first visit at the clinic. Patients were considered to have initiated care if the clinic responded that “Patient was no longer coming to the clinic”, “Patient was still coming to appointments,” or that they referred the patient elsewhere after seeing them for an initial visit. Patients were considered to have been retained at 30 days if the clinic responded that “Patient was still coming to appointments.” Patients who were referred elsewhere and for whom additional information regarding initiation was not available were excluded from further analysis. The study linked follow-up data with initial referral data and de-identified the dataset prior to analysis.

To assess the heterogeneity of the convenience sample, comparisons were made between the patients with follow-up data from clinics and all other patients referred from ED and telemedicine settings during the study period. Chi-square tests assessed differences in distributions of gender, race/ethnicity, age group, insurance type, referral setting, peer support request, naloxone kit receipt, and buprenorphine bridge prescription receipt. The study included only subgroups with at least three members in the patient follow-up sample. Analyses also included comparisons between patients included in the study by whether they were referred from an ED or telemedicine setting, as that was a main variable of interest. Chi-square tests assessed differences in gender, race/ethnicity, age group, insurance type, peer support request, naloxone kit receipt, and buprenorphine bridge prescription receipt between these two groups. There were missing data for ED-referred patients for gender ($n = 30$), race/ethnicity ($n = 32$), insurance type ($n = 1$), naloxone receipt ($n = 7$), and buprenorphine bridge prescription receipt ($n = 6$) and missing data for telemedicine-referred patients for gender (n = 7), race/ethnicity ($n = 15$), naloxone receipt (n = 3), and buprenorphine bridge prescription receipt ($n = 5$).

Descriptive statistics examined the number and percentage of patients who attended their first clinic visit and who were retained in care at 30 days both overall and by factors of interest including gender, race/ethnicity, age group, insurance type, referral setting, peer support request, naloxone kit receipt, and buprenorphine bridge prescription receipt. To examine adjusted relative risk, a multivariable log-binomial regression model calculated relative risk of initial visit attendance and 30-day retention by gender, race/ethnicity, age group, insurance type, referral setting, peer support request, naloxone kit receipt, and buprenorphine bridge prescription receipt. Analyses used log-binomial regression over logistic regression because the outcomes of interest

were not rare (occurred >10 % of the time), thus the odds ratio would overstate the relative risk (McNutt et al., 2003). As a measure of effect for cross-sectional studies, the relative risk is suggested to be both more interpretable and easier to communicate to broad audiences than the odds ratio (Barros & Hirakata, 2003). All analyses used SAS Version 9.4.

The patient inclusion flow-chart is in Fig. 1. The emergency department and telemedicine comparisons and adjusted relative risk analyses both excluded patients with missing data. Missing data were race/ethnicity (47 missing), gender (37 missing), naloxone receipt (10 missing), bridge prescription receipt (11 missing), and insurance (1 missing).

3. Results

Between October 1, 2020, and September 30, 2022, the MATTERS Network made 1349 referrals, of which 536 (39.7 %) originated from an ED and 645 (47.8 %) originated from telemedicine. The MATTERS team requested follow-up data for the 448 (37.9 %), patients that were referred to the top seven clinics by referral volume. The team received data from 5 of the 7 clinics and included data for 394 patients (71.4 % response rate, 33.3 % of the overall sample). The included clinics are in the Capital Region, Long Island, and Western New York.

Data included patient gender and race/ethnicity for 90.6 % and 88.0 % of patients, respectively. There were no differences in gender, age, insurance type, and buprenorphine bridge prescription receipt between patients for whom follow-up data were versus were not available (Table 1). Among 394 patients for whom follow-up data were available, clinics indicated not receiving the referral for 32 (8.1 %) patients and indicated they referred eight (2.0 %) patients elsewhere. Information was obtained regarding initiation for seven of the eight patients referred elsewhere. Ultimately, 393 patients were included in the follow-up subsample.

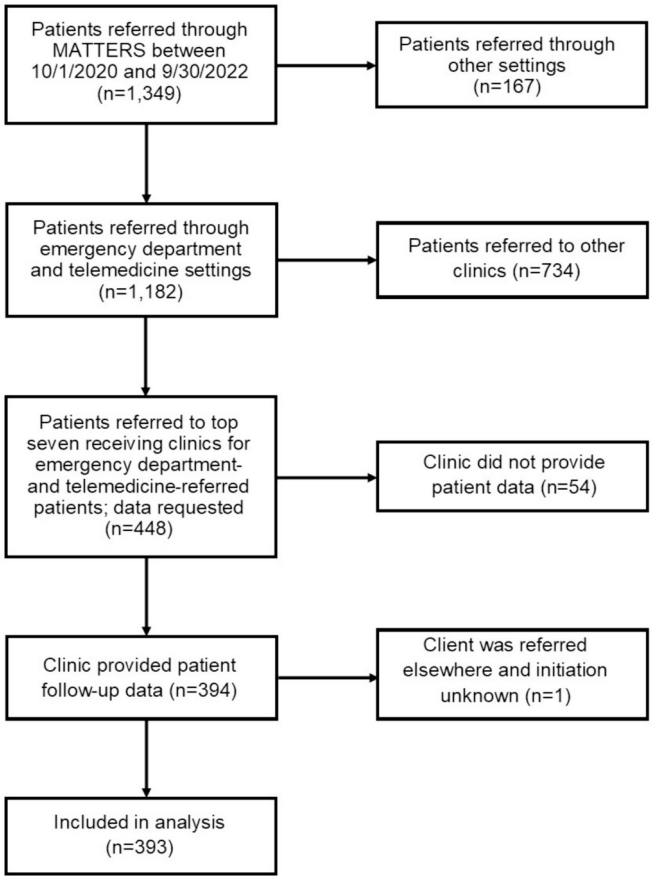

Fig. 1. Patient inclusion flow-chart.

Table 1
Comparison of MATTERS patients included and not included in clinic follow-up data analyses.

	Not in follow-up subsample (%)	Follow-up subsample (%)	*P* Value of Chi-Square comparison
Sample size	788	393	n/a
Gender			
Male	446 (67.1)	240 (67.4)	0.910
Female	219 (32.9)	116 (32.6)	
Race/ethnicity			
White, non-Hispanic	517 (81.4)	247 (71.4)	0.001*
Black, non-Hispanic	65 (10.2)	50 (14.5)	
Hispanic (any race)	53 (8.4)	49 (14.2)	
Age Group			
18 to 24 years	61 (7.8)	29 (7.4)	0.933
25 to 34 years	314 (40.1)	151 (38.4)	
35 to 54 years	346 (44.1)	180 (45.8)	
55+ years	63 (8.0)	33 (8.4)	
Insurance Type			
Medicaid	556 (70.6)	285 (72.7)	0.744
No insurance	109 (13.8)	50 (12.8)	
All other types of insurance	123 (15.6)	57 (14.5)	
Referral setting			
Emergency Department	378 (48.0)	158 (40.2)	0.012*
Telemedicine	410 (52.0)	235 (59.8)	
Requested peer support			
Yes	290 (37.9)	122 (31.0)	0.021*
No	475 (62.1)	271 (69.0)	
Received naloxone kit			
Yes	237 (31.0)	72 (18.8)	<0.001*
No	527 (69.0)	311 (81.2)	
Received buprenorphine bridge prescription			
Yes	588 (77.4)	284 (74.0)	0.201
No	172 (22.6)	100 (26.0)	

Note: Only groups with at least 3 members in the follow-up sample were included in the analysis.
* Denotes statistical significance at the $p < 0.05$ level.

A higher percentage of patients referred from emergency departments were non-Hispanic white, requested peer support, and received a naloxone kit compared with those referred from telemedicine settings, whereas a higher percentage of telemedicine-referred patients received a buprenorphine bridge prescription compared with ED-referred patients (Table 2). There were no significant differences between groups in gender, age group, or insurance type.

Overall, 51.9 % of patients in the follow-up subset attended their first clinic visit and 40.7 % continued to receive care at 30 days. Among patients who attended their first clinic visit, 78.4 % remained in care at 30 days (Table 3). Patients referred from telemedicine were more likely to attend their initial clinic appointment compared to those referred from an ED (65.1 % vs 32.3 %; RR 1.64, 95 % CI 1.12–2.40). Patients referred from telemedicine were also more likely to be engaged in treatment at 30 days compared to those referred from an ED (53.2 % vs 22.2 %; RR 2.59, 95 % CI: 1.63–4.12).

Patients with Medicaid (RR 1.89, 95 % CI: 1.06–3.35) or other types of insurance (RR 2.21, 95 % CI: 1.18–4.11) were more likely to be engaged in treatment at 30 days compared to those with no insurance. Patients who received a buprenorphine bridge prescription were more likely to attend their initial clinic appointment (RR: 1.76, 95 % CI: 1.15–2.70). There was no other significant association between any of the other factors analyzed and attendance at initial clinic appointment or engagement in treatment at 30 days.

Table 2
Comparison of demographic and clinic characteristics of MATTERS patients referred through emergency department and telemedicine settings.

	Referred through emergency department (%)	Referred through telemedicine (%)	P Value of Chi-Square Comparison
Sample size	158 (40.2 %)	235 (59.8 %)	n/a
Gender			
Male	78 (60.9 %)	162 (71.1 %)	0.051
Female	50 (39.1 %)	66 (28.9 %)	
Race/ethnicity			
White, non-Hispanic	94 (74.6 %)	153 (69.5 %)	<0.001*
Black, non-Hispanic	25 (19.8 %)	25 (11.4 %)	
Hispanic (any race)	7 (5.6 %)	42 (19.1 %)	
Age group			
18 to 24 years	11 (7.0 %)	18 (7.7 %)	0.138
25 to 34 years	54 (34.2 %)	97 (41.3 %)	
35 to 54 years	74 (46.8 %)	106 (45.1 %)	
55+ years	19 (12.0 %)	14 (6.0 %)	
Insurance type			
Medicaid	108 (68.8 %)	177 (75.3 %)	0.111
No insurance	19 (12.1 %)	31 (13.2 %)	
All other types of insurance	30 (19.1 %)	27 (11.5 %)	
Requested peer support			
Yes	67 (42.4 %)	55 (23.4 %)	<0.001*
No	91 (57.6 %)	180 (76.6 %)	
Received naloxone kit			
Yes	54 (35.8 %)	18 (7.8 %)	<0.001*
No	97 (64.2 %)	214 (92.2 %)	
Received buprenorphine bridge prescription			
Yes	77 (50.7 %)	207 (90.0 %)	<0.001*
No	75 (49.3 %)	23 (10.0 %)	

Notes: Only groups with at least 3 members in the follow-up sample were included in the analysis.
* Denotes statistical significance at the $p < 0.05$ level.

4. Discussion

In this dataset, patients referred from emergency telemedicine had higher rates of attendance at their first clinic visit and 30-day ongoing care compared to those referred through EDs. The study findings suggest that emergency MOUD initiated via telemedicine is acceptable, and perhaps a preferable, alternative to ED care for many patients with OUD.

Consistent with prior studies (D'Onofrio et al., 2017), patients that received buprenorphine bridge prescriptions were more likely to continue to engage in formal addiction treatment. This association may be due to clinician factors, patient factors, and treatment factors. In this study, a significantly higher percentage of patients referred through telemedicine received a buprenorphine bridge prescription compared with those referred through EDs. Clinicians who embrace lower threshold buprenorphine prescription may also be more likely to counsel and support patients. Patients willing to accept buprenorphine in the ED may be more prepared to enter treatment. Finally, patients whose symptoms are adequately managed with MOUD may be more physically able to attend an appointment. Short term buprenorphine bridge prescriptions may help facilitate first appointment follow-up rates; however, additional engagement and resources such as facilitated enrollment services are likely needed to increase 30-day retention in treatment rates. Through offering medication and transportation vouchers, use of the MATTERS Network further mitigates financial barriers to recovery.

Patients without insurance were less likely to attend their first clinic appointment and less likely to be retained in treatment. Under or uninsured status is a well-known barrier to engagement in all forms of health care (Collins et al., 2022). Insurance type did not significantly differ between patients referred from ED and telemedicine settings. It should also be noted that patients seeking care via emergency telemedicine evaluations through the MATTERS Network may be more motivated to engage in care and subsequently follow up for treatment after referral.

For decades, medical societies, patient advocates, community groups, and public health officials have advocated for increased access to MOUD in primary care, but there is still a scarcity of active MOUD prescribers (Abraham et al., 2019; Haffajee et al., 2019). A national

Table 3
Frequency, percentage, adjusted relative risk (RR), and 95 % confidence intervals (95 % CIs) of initial clinic visit attendance and retention in care at 30 days post-referral.

	Attendance at initial clinic visit		Retention at 30 days post-referral	
	n (%)	Adjusted RR (95 % CI)	n (%)	Adjusted RR (95 % CI)
Gender				
Male	123 (51.3)	0.93 (0.77–1.13)	94 (39.2)	0.86 (0.68–1.09)
Female	62 (53.5)	Ref	52 (44.8)	Ref
Race/ethnicity				
White, non-Hispanic	127 (51.4)	Ref	100 (40.5)	Ref
Black, non-Hispanic	21 (42.0)	1.03 (0.74–1.44)	16 (32.0)	1.00 (0.67–1.49)
Hispanic (any race)	29 (59.2)	0.93 (0.72–1.20)	23 (46.9)	0.92 (0.66–1.28)
Age group				
18 to 24 years	18 (62.1)	1.06 (0.68–1.66)	12 (41.4)	1.11 (0.52–2.35)
25 to 34 years	79 (52.3)	0.94 (0.63–1.39)	68 (45.0)	1.18 (0.65–2.12)
35 to 54 years	93 (51.7)	1.04 (0.70–1.54)	72 (40.0)	1.22 (0.67–2.20)
55+ years	14 (42.4)	Ref	8 (24.2)	Ref
Insurance type				
Medicaid	150 (52.6)	1.20 (0.84–1.70)	122 (42.8)	1.89 (1.06–3.35)*
No insurance	23 (46.0)	Ref	14 (28.0)	Ref
All other types of insurance	31 (54.4)	1.37 (0.93–2.01)	24 (42.1)	2.21 (1.18–4.11)*
Referral setting				
Emergency Department	51 (32.3)	Ref	35 (22.2)	Ref
Telemedicine	153 (65.1)	1.64 (1.12–2.40)*	125 (53.2)	2.59 (1.63–4.12)*
Requested peer support				
Yes	59 (48.4)	1.05 (0.84–1.32)	45 (36.9)	0.99 (0.74–1.32)
No	145 (53.5)	Ref	115 (42.4)	Ref
Received naloxone kit				
Yes	29 (40.3)	0.72 (0.49–1.06)	25 (34.7)	0.98 (0.67–1.45)
No	171 (55.0)	Ref	132 (42.4)	Ref
Received buprenorphine bridge prescription				
Yes	171 (60.2)	1.76 (1.15–2.70)*	134 (47.2)	1.44 (0.92–2.26)
No	28 (28.0)	Ref	22 (22.0)	Ref

Note: Only groups with at least 3 members were included in the analysis.
* Denotes statistical significance at the $p < 0.05$ level.

survey of U.S. primary care physicians in 2019 found that only 20 % were interested in treating patients with OUD and only 8 % had prescribed buprenorphine in the past 12 months (McGinty et al., 2020). Unmet needs in primary care may lead patients to seek emergency care.

Despite aggressive educational and programmatic initiatives, further work is needed to continue to engage the wide range of emergency clinicians practicing today to begin providing buprenorphine initiation and prescriptions in EDs. Clinician and organization level factors may affect adoption of MOUD initiatives (Guerrero et al., 2020). ED physicians often feel that buprenorphine prescription is outside the scope of emergency medicine, or they lack appropriate training to prescribe MOUD (Dong et al., 2021; Im et al., 2020). Engagement of emergency clinicians to initiate and prescribe buprenorphine continues to be a challenge (Im et al., 2020; Sharfstein, 2017). Unfortunately, even after the elimination of the DEA X-waiver requirement as part of the bipartisan omnibus appropriations bill signed into law by President Biden in late 2022, there has not been a substantial rise in the amount of buprenorphine prescriptions issued (Krupp et al., 2023). The MATTERS Network's standardized approach, ease of referral, and recommended standardized dosing model are designed to address some of these concerns.

D'Onofrio et al. (2017) found that ED initiation resulted in increased compliance with addiction treatment as well as reduced illicit use of opioids. Jennings et al. (2021) demonstrated that 77 % of the study participants completed their first post ED-induction appointment and that 43 % remained in treatment at 30 days. Longer-term outcomes have also been established. In 2022, Reuter et al. (2022) found that 37.6 % of patients remained in treatment at 6 months, and 34.8 % at 1 year. These projects all used a specially trained clinician for a brief screening and intervention process to not only provide buprenorphine but connect patients with a community-based service, either substance use disorder program or primary care maintenance, similar to the MATTERS model.

An outpatient treatment program using telemedicine to initiate buprenorphine in a rural area resulted in 57 % of study participants continuing with treatment at 3 months, of which 86 % reportedly had an opioid-negative urine test (Weintraub et al., 2018). A street-based buprenorphine program that continued operations throughout the COVID-19 shutdowns reported that 80 % of patients were still actively engaged after one year, showing no statistical differences between those patients who were already receiving buprenorphine and those who initiated treatment during the pandemic (Harris et al., 2022). However, most of these and other similar studies focus on individuals already in community-based or in-patient treatment. This is the first study examining outcomes of patients following emergency telemedicine referrals for MOUD.

Follow up data included only selected clinics with the largest referral volume. Patient and clinic factors may have made this sample heterogenous compared to the larger referral population. The MATTERS program was created to link patients to treatment regardless of referral environment, which increased treatment options for patients but made data management difficult given that there were >200 possible clinic locations. Although there were some small differences between the convenience sample from whom follow-up data were available and other patients referred through the MATTERS network, key factors including gender, age, insurance type, and buprenorphine bridge prescription receipt were similar. Follow up was also limited to a 30-day engagement. The association between referral source and longer-term engagement is an important topic for future study. Finally, the reasons why patients sought care from an ED versus telemedicine were outside the scope of this study. Patients often arrive at the ED for reasons other than desiring linkage to long term MOUD. ED screening of patients for OUD following overdose or a visit unrelated to OUD is an important goal, but these patients may have been less motivated at the time to engage in care and follow-up (Coupet Jr et al., 2021; Coupet Jr et al., 2022; Hawk & D'Onofrio, 2018; Monico et al., 2020).

5. Conclusion

More than two-thirds of patients referred from the emergency telemedicine environment followed up at their first clinic visit and more than half of these patients were still retained in treatment 30 days after referral. The rates of initial clinic visit and 30-day retention when referred following a telemedicine evaluation are encouraging. Further development of telemedicine programs that offer evaluations, access to medications, and referrals to treatment should be considered.

Allowing patients to initiate MOUD without traveling to a health care facility may address a significant barrier to care for some patients. Flexibility in prescribing regulations, telemedicine evaluations, access to medications, and referrals should be expanded when appropriate. Efforts should be continued to educate those clinicians working in EDs on the importance of considering buprenorphine or other forms of medication for addiction treatment when assessing patients with OUD. Offering bridge prescriptions for buprenorphine and a referral to treatment should also be considered and have demonstrated higher follow-up rates at the initial clinic appointment and higher 30-day retention in treatment rates.

CRediT authorship contribution statement

Joshua J. Lynch: Writing – review & editing, Investigation, Funding acquisition, Conceptualization. **Emily R. Payne:** Writing – original draft, Formal analysis, Data curation. **Renoj Varughese:** Writing – review & editing, Project administration. **Hilary M. Kirk:** Writing – review & editing. **Daniel J. Kruger:** Writing – review & editing. **Brian Clemency:** Writing – review & editing, Funding acquisition, Conceptualization.

Declaration of competing interest

None.

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