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Referrals to an Opioid Overdose Program with EMS Involvement: Comparing Treatment Outcomes

Courtney Haas
University of Missouri-St. Louis, cthwd9@mail.umsl.edu

REFERRALS TO AN OPIOID OVERDOSE PROGRAM WITH EMS INVOLVEMENT: COMPARING TREATMENT OUTCOMES

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COURTNEY T. HAAS, RN, BSN

Allison Brauch DNP, APRN, AGNP-BC, PMHNP-BC

Sheila Grigsby PhD, RN, MPH, APHN-BC

Wendy Orson, MS, LPC, NCC

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Abstract

Problem. The rising rates of opioid overdose deaths continue to be a significant public health concern. Innovative programs utilizing a Recovery Coach in the Emergency Department (ED) have demonstrated initial success. However, there is limited evidence to support their effectiveness for improving treatment or recovery outcomes for people living with opioid use disorder. The purpose of this study was to evaluate whether the method of arrival to the ED for an opioid overdose affects engagement and retention in an opioid overdose project in a midwestern metropolitan area, which utilizes a Recovery Coach in the ED.

Methods: Utilizing the Plan-Do-Study-Act framework, this study evaluated the Engaging Patient's in Care Coordination (EPICC) program. The primary investigator conducted a retrospective chart review for individuals referred to the program between December 2016 and October 2018. The study compared clients who arrived at the ED via EMS and clients who came to the ED another mode of transportation and its effect on program engagement and retention rates.

Results. During this period, 1,769 referrals (N =1,769) met project inclusion criteria. Within the sample, 31.7% of individuals arrived at the ED via EMS (n=560) and 68.3% arrived another mode of transportation (n=1,209). Results from χ^2 found a statistically significant relationship between arrival to the ED and early engagement and retention in the EPICC program.

Implications for Practice. Clients who arrive at the ED without EMS are more likely to initially engage and remain in the EPICC project versus those who arrive with EMS. Differences may be affected by treatment-seeking behavior, in terms of levels of

motivation. Individuals who arrive at the ED via EMS my present involuntarily and have less motivation than individuals who voluntarily present to the ED. Implications of this project should consider how to reduce the number of individuals who arrive by EMS and decline or drop out of the program and how to support them in recovery effectively.

Referrals to an Opioid Overdose Program with EMS Involvement: Comparing Treatment Outcomes

In the United States, the ongoing opioid epidemic has emerged as the most pressing public health crisis of the present day. Opioid-related overdose deaths increased by 45% between 2016 and 2017, with over 47,600 cases in 2017 alone (Hedegaard, Miniño, & Warner, 2018). Overdose deaths from opioids, including prescription opioids, heroin, and synthetic opioids have increased almost six times since 1999 (Centers for Disease Control & Prevention, 2018). Local, state, and federal agencies have increased efforts to create innovative programs to treat Opioid Use Disorder (OUD) and related unintended consequences.

The Emergency Department (ED) has become a familiar setting for healthcare providers to care for individuals with OUD. ED visits for non-fatal opioid overdose events increased by 30% from 2016 to 2017 and climbed as high as 70% in the Midwest region (Vivolo-Kantor et al., 2018). Each related ED visit presents as a critical opportunity to reduce overdose mortality rates and provide treatment and linkage to outpatient OUD treatment (Duber et al., 2018). Individuals who experience a non-fatal overdose event are considered high risk, as they frequently experience a repeat opioid overdose and have a higher chance of fatal overdose the following year (Olfson, Wall, Wang, Crystal, & Blanco, 2018).

Current literature supports utilizing peer support or Recovery Coach for individualized addiction recovery support and treatment navigation (Myrick & del Vecchio, 2016). Recovery Coaches are individuals in recovery who provide experiential, non-clinical support to those living with a substance use disorder and seeking recovery assistance (U.S. Department of Health and Human Services, 2018). In the literature, a Recovery Coach may also be called Certified Peer Recovery Specialist, Recovery

Support Specialist, Peer Support Worker, Peer Mentor, or Counselor (Myrick & del Vecchio, 2016). As ED's are beginning to implement various strategies to effectively treat individuals with OUD and one intervention that appears promising in the literature is ED-based Recovery Coach support.

In December 2016, a nonprofit organization in a metropolitan Midwestern area developed a Recovery Coach Program to increase access to substance use treatment for opioid overdose survivors in the ED (Behavioral Health Network, 2018). Upon arrival to a participating medical facility for an opioid overdose, ED staff call the Engaging Patients in Care Coordination (EPICC) referral line. If the client is eligible for the program, a Recovery Coach dispatches to the referring hospital ED outreach. During outreach and the initial face-to-face meeting, the Recovery Coach offers support and various methods of treatment follow-up care (BHN, 2018). Strategic planning for the EPICC program includes expanding services to individuals who may not present to the ED, as they refuse transportation from Emergency Medical Responders (EMS).

The purpose of this clinical scholarship project was to evaluate whether the method of arrival affects engagement and retention in the EPICC program. The significance of this project will inform the efficiency of this program in the participating Emergency Departments. This study evaluates the EPICC program, and specifically asks: How do engagement and retention rates in the EPICC program for individuals who present to the ED for an opioid overdose via EMS compare to individuals who arrive at the ED for an opioid overdose via another mode of transportation?

Review of the Literature

Search engines used included PubMed, Google Scholar, EBSCO HOST, Cochrane Science Direct, and the Cumulative Index to Nursing and Allied Health

Literature (CINAHL). Settings on the databases were adjusted to produce articles published after the year 2013. Search terms included: opioid overdose, Opioid Use Disorder, Recovery Coach, peer support, Emergency Department, ambulance services OR EMS, linkage to treatment OR substance use treatment. Inclusion criteria were opioid overdose programs and linkage to addiction treatment, peer recovery studies from any country published in English, and studies related to peer outreach. Exclusion criteria were studies published before 2012, did not include opioid overdose programs or linkage to addiction treatment, studies published only in a language other than English, studies with no mention of peer outreach.

Opioid Use Disorder (OUD) is a chronic, relapsing brain disorder that affects more than 2 million Americans (Substance Abuse and Mental Health Services Administration, 2018). According to a National Survey on Drug Use and Health, almost 11 million American adults, age greater than 18, misused opioids in the past year (Substance Abuse and Mental Health Services Administration, 2018). Males (6.4 million or 4.9%) misused opioids more frequently than females (5.4 million or 3.9%) and young adults aged 18 to 25 years reported the highest rates of misuse (Substance Abuse and Mental Health Services, 2018).

OUD is often associated with increased morbidity and mortality. The growing rates of OUD and opioid-related deaths in the United States continues to be an urgent public health concern. The most recent final mortality data found that 68% of the 70,200 drug overdose deaths in 2017 involved an opioid (Scholl, Seth, Kariisa, Wilson, & Baldwin, 2019). On average, 130 Americans die every day from an opioid-related overdose (Centers for Disease Control and Prevention, 2018).

Treatment of individuals with OUD is complex and often compared to the treatment of other chronic relapsing disorders such as diabetes and hypertension (Schukit, 2016). The current standard of care is medication-assisted treatment (MAT), a combination of pharmacotherapy (methadone, buprenorphine, or naltrexone) and behavioral therapy (Schuckit, 2016; Spier, 2016). Despite the efficacy of treatment, MAT for OUD is underused. Few individuals with the disorder receive OUD specific treatment and medicines for OUD are often underused (Naeger, Mutter, Ali, Mark, & Hughley, 2016; Wu, Zhu, & Swartz 2016). One study reported that only 30% of individuals who experienced a non-fatal opioid overdose received medications for OUD in the year after their overdose (Larochelle, 2018). When patients are prescribed medications, the dosage is frequently too low or for too short a duration (Larochelle, 2018). Motivation for treatment in patients with addiction disorder is known to affect prognosis and reported to be among the most common reasons for failed treatment adherence and relapse (Laudet & Stanick, 2010). Levels of motivation for treatment may be affected by the circumstances of admission, and individuals who voluntarily enter substance use treatment scored higher on a motivation for treatment scale than individuals admitted for a legal reason or family insistence (Bilici et al., 2014).

The alarming rates of OUD and related deaths and the low engagement rates in substance use treatment have challenged health care systems to find innovative strategies to identify and treat high-risk opioid users (Hser et al., 2017). Due to the complex and critical nature of the epidemic, reversing the opioid crisis requires a multifaceted and collaborative approach. One specific intervention that shows positive results to increase

treatment and adherence for OUD is the use of peer Recovery Coaches in the ED for individualized treatment support (Myrick & del Vecchio, 2016; Spier, 2016).

The Substance Abuse and Mental Health Services Administration [SAMSHA] defines peer workers, or as referred to in this study, Recovery Coaches, as individuals who have been successful in the recovery process and offer help to others experiencing similar situations (U.S. Department of Health & Human Services, 2018). Through shared understanding, respect, and mutual empowerment, Recovery Coaches provide non-clinical support to help others engage in the recovery process and decrease the likelihood of relapse (U.S. Department of Health & Human Services, 2018). Two systematic reviews examined articles published between 1995 to 2014 on the effectiveness of the services Recovery Coaches provide, and both concluded that they have a positive impact on participants (Bassuk, Hanson, Greene, & Laudet, 2016; Reif et al., 2014). In the articles reviewed, research suggested services provided by a Recovery Coach decreased emergency department utilization, reduced relapse rates, reduced substance use, and increased treatment retention (Bassuk et al., 2016; Reif et al., 2014).

As the literature continues to expand, findings illustrate how peer Recovery Coaches and support services have become an essential component in a variety of settings within behavioral healthcare systems (Myrick & del Vecchio, 2016). Recovery Coaches have emerged in several Emergency Departments across the nation and show promising preliminary results (Ashford, Meeks, Curtis, & Brown, 2018; Bassuk et al., 2016; Myrick & del Vecchio 2016; Samuels et al., 2019, Waye et al., 2018.)

Community nonprofits or recovery community organizations usually facilitate peer support services, rather than through hospital systems or the ED (Myrick & del

Vecchio, 2016). In 2014, AnchorED, one of the first recovery community organizations to employ certified Recovery Coaches to connect with opioid overdose survivors in the ED, was established in Rhode Island (Joyce & Bailey, 2015; Waye et al., 2018). Recovery Coaches meet with patients to provide overdose prevention education, discuss available recovery resources in the community, and provide naloxone to patients considered at high risk for repeat overdose (Waye et al., 2018). The following ten days after discharge, Recovery Coaches follow-up with patients to encourage engagement in recovery support services (Waye et al., 2018.) During the first year of operation, Recovery Coaches connected with 230 opioid overdose survivors, and 83% agreed to recovery support following ED discharge (Joyce & Bailey, 2015).

Samuels et al. (2018) evaluated patient outcomes of a similar peer Recovery Coach program six months after the initial implementation of the program. Depending on patient discretion and service availability, providers assign individuals treated in the ED after an opioid overdose to one of three treatment groups including 1) usual care, 2) take-home naloxone, or 3) peer recovery coach and take-home naloxone (Samuels et al., 2018). 151 individuals met eligibility criteria, and researchers concluded that ED peer recovery consultation and naloxone administration was an effective intervention to decrease repeat ED visit, increase time of MAT initiation and reduce mortality among patients treated in the ED after an opioid overdose (Samuels et al., 2018).

One strength of the peer-based program model is the ability to successfully engage high-risk patients regardless of the setting, insurance status, or substances regularly used (Ashford et al., 2018). Recovery Coaches in the ED appears beneficial in engaging all substance users, not just individuals who overdose on opioids (Ashford et al.

2018). Over literature suggests peer support programs in the ED is a promising intervention. Further research should focus on associated treatment outcomes and retention of substance use and recovery support treatment (Powell et al., 2019; Samuels et al., 2018).

Opioid overdose survivors often arrive the ED with Emergency Medical Services (EMS) after administration of naloxone, a life-saving medication that reduces the effects of opioids. According to a national database of EMS events, the rate of naloxone administrations increased by 75.1% between 2012 to 2016, mirroring the 79.7% increase in age-adjusted opioid mortality rate (Cash et al., 2018). According to Sepalki (2018), approximately 11% of suspected opioid overdose patients encountered by EMS refused further treatment or transportation to a medical care facility. A new group of programs has appeared and attempt to engage opioid overdose survivors in community-based settings utilizing collaborations between public health and public safety agencies (Formica et al., 2018). These collaborations are not intended to replace ED-based interventions, but rather provide resources to individuals who leave, are not ready to accept, or do not present to the ED (Formica et al., 2018). The effectiveness of these programs remains largely untested.

The opioid epidemic is a multifaceted crisis. Overall, this literature review supports the use of peer Recovery Coaches in the ED and the need to continue evaluation of these programs for long term effects. EMS can play a more significant role in battling the opioid epidemic, especially as programs plan to collaborate with public safety agencies. There is a need for further exploration of EMS arrival to the ED and its relationship in substance use treatment. An evaluation of an established ED peer

Recovery Coach program and EMS involvement would be useful in determining if these types of programs increase engagement with addiction treatment services. This quality improvement project will utilize the Model for Improvement, including the Plan-Do-Study-Act cycle of change framework.

Method

Design

Guided by the Plan-Do-Study-Act frame, this study is a program evaluation of the Behavioral Health Network's EPICC program. A retrospective case record review was conducted to compare engagement and retention rates in the EPICC project between two groups: individuals who arrive at the ED via EMS and those arriving at the ED via another mode of transportation. Referrals to the EPICC project and utilized in this study occurred between December 1, 2016, and October 30, 2018.

Setting

The Behavioral Health Network, the organization that oversees implementation of the EPICC project, serves a vast Midwestern area, consisting of seven urban, suburban, and rural counties. Within this metropolitan area, there were 2,401 deaths due to opioid overdoses between 2013 to 2017 (Missouri Department of Health, 2018). The rate of death for opioids in this area (25.2 per 100,00) has surpassed the national average (14.6 per 100,000). Within the seven counties, there are 14 medical facilities EDs, and five substance use providers collaborating in the project.

Sample

This study utilized a convenience sample of individuals who present to participating hospital ED for an opioid overdose and are referred to the EPICC project by

ED staff. There were initially 2,119 referrals to the EPICC project between December 2016 and October 2018. Inclusion criteria for this study included: opioid overdose survivors, aged 18 and older, who present to the ED at participating medical care facility, and EMS involvement documentation is complete on the referral form (yes or no; Appendix A). Exclusion criteria included: younger than 18 years old, referred from outside the defined area or referral source, or already engaged in substance use treatment. The number of referrals included in the analysis for this project was 1,769. Individuals may be referred to the EPICC project more than once, and 222 referrals in this sample represent a client who has previously been referred to the project. Additional referrals are not included in all sample demographics, as reflected in Table 1 *(N*=1,547).

Procedures

A quality improvement team was formed and included the organization's director, the project manager, and the data analyst. The team communicated by both face-to-face meetings and via email to discuss progress, recommendations, and offer guidance throughout the process. The EPICC program is planning to expand services and collaborate with EMS. Therefore, the team decided that this study should examine the relationship between EMS involvement in past referrals and linkage to addiction treatment services.

Data Collection and Analysis

All data used for this study via EPICC forms filled out by Recovery Coaches. The Behavioral Health Network provided a limited data set with the previously agreed upon variables. All data were de-identified and coded with a randomly generated subject ID. The study compared the following variables between the two groups (EMS involvement

vs. No EMS involvement): the number of referrals, referral sources, recovery coach outreach, successful initial contact, engagement in EPICC at initial contact, and retention in EPICC (at two weeks, 30 days, 3 months, and 6 months). Baseline demographics, including age, gender, race, insurance status, and housing status, were collected as they may affect the ability to follow up or receive treatment. Following the initial descriptive analysis, it was determined that ad hoc testing of demographic and other variables would be beneficial to identify any significant relationships that might warrant future study. Significance was determined a priori at .05, and only significant relationships are reported. Chi-square tests were used to evaluate the statistical significance of the method of arrival to the ED for all variables listed above. SPSS Version 26.0 was used to analyze all data.

Approval Processes

A data use agreement was obtained by the Behavioral Health Network of Greater St. Louis to provide a de-identified limited data set for the use of this project. The University of Missouri-St. Louis Internal Review Board approved this study before receiving and analyzing the data.

Results

The number of referrals to EPICC from December 1, 2016, through October 31, 2018, and analyzed in this study was 1,769 (N = 1,769). EMS was involved in 31.7% of referrals (n = 560) and 68.3% arrived at the hospital ED via some other mode of transportation (n = 1,209). The highest number of referrals occurred in March 2018 (n = 147, 8%) and most referrals were from an urban hospital ED (n = 677, 38.3%). At the time of referral, most individuals were eligible for services (n = 1726, 97.6%), however,

few declined services (*n* = 43, 2.4%). Recovery Coaches were dispatched to hospital ED's for outreach on 96.4% (*n* =1706) of eligible EPICC referral. Recovery Coaches were able to successfully outreach and meet face-to-face with 94% (n = 1610) of clients outreached at the hospital and engaged 91.2% (*N* =1,555) of clients in the EPICC project. All variables at the time of referral listed in Table 2. A chi-square test of independence was performed to examine the relationship between arrival to ED and a successful ED outreach with a Recovery Coach. Results from the Pearson chi-square test suggested that the relationship is significant, (χ^2 (1, *N*= 1706) = 4.836, p=.02). Clients who arrived at the ED without EMS were more likely to have a successful ED outreach with a Recovery Coach vs. those who arrived with EMS (95.2% vs. 92.6%).

A chi-square test of independence was performed to examine the relationship between arrival to ED and engagement in EPICC. Results from the Pearson chi-square test suggested that the relationship is significant (χ^2 (1*, N*=1705) = 6.323, p=.012). Clients who arrived at the ED without EMS involvement were more likely to engage in the EPICC program after a successful outreach by a Recovery coach vs. those who arrived at the ED via EMS (92.4% vs. 88.7).

Retention in EPICC decreases over time, and about half of the clients initially engaged at hospital outreach with a Recovery Coach continued participating in the program at two-week follow-up (*n*=769, 49.5%). A chi-square test of independence was performed to examine the relationship between EMS involvement and retention in EPICC. Results from the Pearson chi-square test suggested that the relationship between EMS involvement and participation in EPICC at two weeks was significant (χ^2 (1, *N*=1555) = 14.031, p<.001). Clients who arrived at the ED without EMS were more

likely to be participating in the EPICC program at two weeks compared to clients who arrived via EMS (52.4% vs. 42.2%).

Among the clients participating in EPICC at two-week follow-up, 75% (*n*=632) were still participating in EPICC at 30-day follow-up. Although not statistically significant, clients who arrived at the ED without EMS were more likely to be participating in EPICC at 30 days compared to clients who arrived via EMS (76.3% vs. 73.7%). Among the clients participating in EPICC at 30-day follow-up, 60% (*n*=384) remained to participate in EPICC at three months, and among those participating at three-month follow-up, 59.3% (*n*=228) of participants were participating in EPICC at six-month follow-up. Method of arrival did not appear to impact retentions rates at three month or six-month follow-up. The relationships between EMS arrival and Non-EMS arrival and engagement and retention rates is listed in Table 3.

Discussion

Clients who arrive at the ED without EMS are more likely to initially engage and remain in the EPICC project compared to clients who come to the ED with EMS. Differences between the two groups may be affected by increased levels of motivation in individual in the Non-EMS group who seek treatment at ED compared to individuals who arrive via EMS, as they may arrive involuntarily. Literature supports that circumstances of admission affect level of motivation for substance use treatment, as one study found that motivation for treatment was higher in the patients admitted voluntarily to a substance use treatment center compared to those in treatment as part of legal follow-up program or at the insistence of their family (Bilici et al., 2014).

As measured against benchmarks in the literature, EPICC maintains engagement beyond the usual program, which speaks to volumes to the efficacy of this program. Due to the lack of research, this study is unable to be compared to another ED program that utilizes a Recovery Coach. However, in a recent study which followed individuals 30 days after hospitalization for OUD or an opioid overdose, only 17% of patients were engaged in SUD (Naeger et al., 2016).

Implications for this project should consider how to reduce drop off of individuals who arrive by EMS to the ED and how we can effectively support those who decline EMS transportation in the community, as such program expansion is part of the EPICC strategic plan. Further study should consider ways to build motivation for changing behavior and treatment, such as motivational interviewing and motivational enhancement therapy.

Recovery Coach dispatched to the ED to provide recovery support and linkage to treatment is a promising strategy to increase engagement and retention in substance use treatment. This study provides important preliminary information about patient outcomes; however, there are several limitations. First, the study is exploratory in nature, and the result should be interpreted as preliminary and descriptive. All data analyzed were collected by the organization which coordinates the EPICC project and later provided to the primary investigator for evaluation. Variables included in data collection were chosen based on programmatic needs, rather than the evaluation in mind. Recovery Coaches collect data by filling out patient self-reported follow- up forms, which is not as robust as clinically collected data.

Conclusion

How an individual arrives at the ED is statistically significant when it comes to patients engaging and remaining in an opioid overdose program which utilizes a Recovery Coach in the ED. This study speaks to the efficiency of the EPICC project. Further research should focus on how to effectively reduce the number of individuals who decline or drop out of the EPICC program and ways to support individuals who might not initiate treatment.

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Table 1
Client Demographics

	(*N* = 1,547)	
Variable	*n*	(%)
Age (years): *M = 36.78*		
18 – 25	175	(11.3)
26 – 35	627	(40.5)
36 – 45	458	(29.6)
46 – 65	270	(17.5)
65 +	15	(1.1)
Gender		
Male	984	(63.6)
Female	563	(36.4)
Race		
Caucasian	850	(54.9)
Black or African American	652	(42.1)
Other	22	(1.4)
Declined to Answer	23	(1.5)
Insurance Status		
Private	125	(8)
Uninsured	864	(55.8)
Other	383	(24.8)
Unknown/refused	157	(10.2)
Housing Status		
Homeless	330	(21.3)
Denies Homeless	1217	(78.7)

Table 2
Variables at Time of Referral

	(*N* = 1,769)	
Variable	*n*	(%)
Arrival to ED		
EMS Involvement	560	(31.7)
No EMS involvement	1209	(68.3)
Referring Agency		
Barnes-Jewish Hospital	677	(38.3)
SLU Hospital	279	(15.8)
SSM Health DePaul Hospital	160	(9.0)
Christian Hospital	140	(7.9)
Mercy – South (St. Anthony's)	126	(7.1)
Mercy – St. Louis	118	(6.7)
Mercy – Jefferson	77	(4.4)
St. Mary's Hospital	55	(3.1)
Mercy – Washington (Franklin)	49	(2.8)
St. Joseph's – Wentzille	45	(2.5)
St. Joseph's – St. Charles	29	(1.6)
St. Joseph's – Lake St. Louis	11	(.6)
BJH	2	(0)
Mercy – Lincoln	1	(0)
EPICC Participation		
Eligible for Services	1726	(97.6)
Declined Services	43	(2.4)
Recovery Coach Outreached		
Yes	1706	(96.4)
No	63	(3.6)

Table 3
Comparing Outcomes of EPICC Engagement & Retention between EMS & NON-EMS

	EMS		No EMS		x^2	*p* value
	n	(%)	n	(%)		
Engagement						
Referral						
Agreed	542	(96.8)	1184	(97.9)	2.121	.145
Declined	18	(3.2)	25	(2.1)		
Initial Contact						
Engaged	477	(88.7)	1078	(92.4)	6.323	.012*
Declined	61	(11.3)	89	(7.6)		
Retention						
2 Week	202	(42.2)	567	(52.4)	13.906	>.001*
30 Day	168	(73.7)	472	(76.3)	.595	.441
3 Month	103	(60.9)	286	(60.0)	.051	.821
6 Month	65	(61.9)	163	(56.6)	.890	.346