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“Another tool for the tool box? I'll take it!": Feasibility and acceptability of mobile recovery outreach teams (MROT) for opioid overdose patients in the emergency room

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ABSTRACT

Drug poisoning deaths involving opioids have increased exponentially in the United States. Post-overdose outreach to patients in the emergency room (ER) is a promising strategy for increasing uptake of medication assisted treatment and reducing subsequent overdose. We conducted a mixed methods study to investigate the feasibility and acceptability of a mobile recovery outreach team (MROT) program for opioid overdose patients presenting in Nevada's ERs, which was funded by the SAMHSA Opioid State Targeted Response (STR) grant. We interviewed 25 ER staff using quantitative questions informed by Diffusion of Innovation (DOI) theory and qualitative questions regarding their experiences caring for overdose patients, perceived benefits, and concerns about the MROT program. Respondents expressed strong support and enthusiasm for the program, identified advantages of the program relative to standard of care, highlighted logistical issues that must be addressed prior to implementation, and illustrated how the MROT program is compatible with their personal and professional values. Our results suggest that the STR-funded MROT program could reduce burden and stress among ER staff and improve patient outcomes, but must be informed by formative research that addresses issues of logistical complexity and cultural compatibility.

1. Introduction

Drug poisoning deaths in the United States have increased exponentially since 1979, with opioids becoming the leading cause of drug overdose deaths in 2010 (Jalal et al., 2018). The death toll in 2016 surpassed 63,000 lives (Hedegaard, Warner, & Miniño, 2017). People who survive a non-fatal overdose are at elevated risk for all-cause mortality and overdose death (Coffin et al., 2007; Darke, Mills, Ross, & Teesson, 2011). In a national study of Medicaid patients who presented with a nonfatal overdose, 18.9% experienced another overdose within 1 year and 1% died of an opioid overdose within the 1-year observation period (Olfson, Wall, Wang, Crystal, & Blanco, 2018). A retrospective study of overdose patients revived by Emergency Medical Services (EMS) personnel in Massachusetts found that 10% of those patients died

within one year, with opioid overdose listed as the cause of death in 35% of cases (Weiner, Baker, Bernson, & Schuur, 2017). A similar analysis in Nevada found that 10% of patients hospitalized (inpatient or emergency room (ER) encounter) for opioid overdose between October and December 2015 died within the following year; 40% of the deaths were due to accidental overdose (Thompson, 2017).

Based on the elevated risk for death among people who survived a non-fatal overdose, the moments following medical stabilization in an ER subsequent to an opioid overdose represent a critical moment for the delivery of risk reduction services including: risk assessment, opioid overdose education and take-home naloxone (THN), peer recovery coaching and support, and linkage to medication assisted treatment (MAT; Ellison et al., 2016). In fact, this critical time has been described as a “teachable moment”, in which the perception of risk is increased, a

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strong emotional response is experienced, and self-concept or social role could be redefined (McBride, Emmons, & Lipkus, 2003). Some research has shown that talking to someone about treatment after an overdose can increase the likelihood of treatment seeking (Pollini, McCall, Mehta, Vlahov, & Strathdee, 2006). However, in 2016 the Substance Abuse and Mental Health Services Administration (SAMHSA) reported that 40% of privately insured patients did not receive any follow-up services within 30 days of an opioid-related hospitalization, and only 11% received both medication and therapeutic services (Ali & Mutter, 2016).

Research suggests that ER clinicians are willing to provide interventions to help patients reduce their risk for subsequent overdose, although lack of knowledge, time, training, and institutional support present significant barriers (Drainoni et al., 2016; Samuels et al., 2016). One solution to this problem is to bolster ER staff capacity by partnering with mobile recovery outreach teams (MROT). MROT are comprised of behavioral health professionals (e.g., licensed/certified substance abuse counselors) and people with lived experience of opioid use who are in recovery (i.e., “peers”), who provide recovery support, coaching, and linkage to services for opioid overdose patients (Reif et al., 2014). This type of post-overdose outreach program has garnered enthusiasm in recent years as a promising response to the growing epidemic of overdoses (Formica et al., 2018; Powell, Treitler, Peterson, Borys, & Hallcom, 2019; Samuels, Baird, Yang, & Mello, 2019; Wayne et al., 2019), though precedent for such programs has existed for decades (Davidson, 1999).

In 2018, Nevada established MROT with funding provided through the SAMHSA State Targeted Response to the Opioid Crisis grant. These teams consist of state licensed/certified alcohol and drug counselors and certified peer recovery support specialists, who are trained on brief negotiated interviewing techniques and THN provision. The teams are housed within Integrated Opioid Treatment and Recovery Centers (IOTRCs). IOTRCs are certified substance use disorder treatment centers that provide MAT (i.e., methadone, buprenorphine, and naltrexone) and related behavioral health services, and serve as ‘hubs’ from which referrals to other services can be made. The MROT are designed to contact patients in the ER and provide assessment, recovery support and coaching, overdose education and THN, and a warm handoff to MAT and/or other services.

MROT have the potential to decrease overdose deaths and increase uptake of treatment for patients who present in the ER with an opioid overdose. However, little is known about the feasibility and acceptability of such an intervention delivered in an ER setting remain. Introducing a new intervention, such as the MROT, can challenge existing operational structures and the cultural *status quo*. Unanticipated barriers to implementation can result in lack of intervention fidelity, delayed implementation, or other program failures. Therefore, effective implementation requires that we understand how the intervention is perceived by clinical staff, and address any pre-implementation barriers to ensure broad and successful uptake of such a program. The current study reports the findings from a study designed to assess the feasibility and acceptability of an MROT program among ER staff, prior to a statewide rollout of the program.

2. Materials & methods

2.1. Sample

ER staff were recruited by the research team via word-of-mouth and flyers with information about the study distributed through hospitals and professional organizations. ER staff were recruited from hospitals that had not yet received the MROT intervention, but which had the potential to become implementation sites over the course of the statewide rollout. All study procedures were approved by the University of Nevada, Reno Institutional Review Board. All participants provided informed consent before participating in study activities. The IRB

granted a waiver of documentation of informed consent because a signed consent form would be the only documentation linking participants to the study; therefore, no identifying information was collected.

2.2. Data collection

Data were collected in one-on-one, mixed methods interviews using a survey that collected both quantitative and qualitative data. The survey was programmed in Qualtrics (an online survey platform that can be administered via a secure web connection), administered on a tablet, and digitally recorded to facilitate analysis of the qualitative data. In rare instances when internet connectivity was interrupted, surveys were collected on paper and entered manually into the Qualtrics database at a later time.

2.3. Theoretical framework

Our study was guided by Rogers' (1995) Diffusion of Innovations (DOI) Theory. DOI can be used to examine how novel clinical interventions, such as the MROT, are adopted in organizations. Five characteristics of the innovation are outlined in the theory: relative advantage, compatibility, complexity, trialability, and observability. Relative advantage represents the degree to which the innovation is perceived as better than the current standard of care. Compatibility represents the degree to which the innovation is compatible with values, experiences and needs of the clinical adopters. Complexity represents how difficult the innovation is to implement. Trialability has to do with the degree to which the innovation can be tried and subsequently modified, while observability represents the degree to which the adoption of the innovation can be seen by others.

2.4. Measures

First, we provided a brief description of the MROT program:

The Mobile Recovery Outreach program is a team that works for one of the Integrated Opioid Treatment and Recovery Centers, funded by the SAMHSA State Targeted Response grant. The goal of the program is to contact opioid overdose patients in the ER, and provide services such as naloxone distribution, peer recovery support, and linkage to treatment and other services.

If respondents were unclear or asked for additional information about the program, interviewers offered further description. For example:

When an opioid overdose patient comes into the ER you can call the team and a counselor and/or peer support will be dispatched to the hospital. The team can provide patients with access to treatment, housing, food, and even peer support.

If respondents were unfamiliar with the concept of peer recovery support, interviewers offered a very brief explanation of the concept. Then, we asked a set of qualitative questions that elicited descriptions of typical encounters with opioid overdose patients and the respondent's impressions of how the MROT would integrate into existing ER operations. We also asked questions about their worries/concerns and perceived benefits of the program.

Next, we asked a set of quantitative questions developed for this study that elicited opinions about the MROT program on three of the five DOI dimensions: relative advantage, compatibility, and complexity. We did not measure trialability or observability because this research occurred prior to implementation of the program. Participants were asked whether they agreed or disagreed with each statement using a 4-point Likert scale ranging from 1 (strongly disagree) to 4 (strongly agree). Three questions assessed relative advantage (e.g., The Mobile Recovery Outreach program is a substantially better option for me than providing patients with a referral sheet with treatment program contact

information.) Four questions assessed *complexity* (e.g., It is (or would be) easy for me to refer opioid overdose patients to the Mobile Recovery Outreach program.) Seven questions assessed *compatibility* (e.g., The Mobile Recovery Outreach program is a good fit for an ER's needs.)

We also asked six questions to assess the ER staff's level of awareness, support, and enthusiasm for the MROT program (e.g., I'm enthusiastic about the Mobile Recovery Outreach program in hospitals I work in.), using the same 4-point Likert scale ranging from 1 (strongly disagree) to 4 (strongly agree).

We asked a small set of demographic questions, including age, sex, race, and education/licensure. Finally, we asked two questions about participants' clinical experience, including number of years worked in Emergency Medicine and number of overdose patients treated in a typical week.

2.5. Analysis

Quantitative data were analyzed by generating frequencies or measures of central tendency, as appropriate. A few quantitative questions were worded negatively and therefore the Likert scale was reversed so that all responses to items are presented in the same direction. Because of the small sample size and exploratory nature of the inquiry, we did not conduct hypothesis testing. Qualitative data were transcribed verbatim and analyzed using an inductive thematic approach. Transcripts were loaded into ATLAS.ti for organization and coding. The lead author read all of the transcripts in their entirety and, in collaboration with two team members, developed a set of "open codes" that represented emergent and a priori themes, documenting impressions and code definitions in analytic memos (Miles & Huberman, 1994). The codes were organized into a codebook that was iteratively applied to the entire data set by the lead author, and transcripts were re-examined when new codes were added to the codebook. Transcripts were then read by a second analyst and any discrepancies in the application of codes were discussed until the two analysts reached agreement. Text resulting from the coding process was output from ATLAS.ti and a final round of axial coding identified relationships among the codes and documented those relationships in the analytic memos.

Following Creswell's (2014) typology for a Convergent Parallel Mixed Methods design, the qualitative and quantitative data were analyzed separately and then integrated in the final step of analysis. Quantitative frequencies were examined first to understand patterns in the DOI constructs. Qualitative data were then investigated in the context of those quantitative patterns and the DOI constructs, to provide illustrative examples of the respondents' attitudes towards the program, including perceived benefits and concerns. We provide illustrative qualitative quotes followed by the respondent ID number.

3. Results

3.1. Sample description

Twenty-five ER staff who have direct clinical contact with patients participated in this study. Demographic and occupational characteristics are described in Table 1. To protect respondents' confidentiality in the small communities where this research was conducted, we do not report counts in cells with size < 5. Three quarters (n = 19, 76%) were female and the median age was 32 (IQR 25, 54). Most were non-Hispanic/Latino (n = 21, 84%) and white (n = 17, 68%). Respondents held multiple degrees and levels of licensure; most were nurses (RN/LPN/CAN/DNP; n = 18, 72%) with fewer reporting other roles such as ER Tech or physician. ER staff had been working in emergency medicine for a median of 6 years (IQR 1, 25) and estimated that they treat a median of 3 overdose patients in a typical week (IQR 0, 40).

Table 1
Demographic and occupational characteristics of emergency room staff (N = 25).

	n	%	Mean	SD	Median	IQR
Age			34.2	8.02	32	25,54
Gender						
Male	6	24				
Female	19	76				
Non-Hispanic/Latino ethnicity	21	84				
White Race ^a	17	68				
Level of education/licensure (check all that apply) ^b						
RN/LPN/CAN/DNP	18	72				
Tech	6	24				
Other ^a	9	36				
Years worked in Emergency Medicine			8.62	7.69	6	1, 25
Number of opioid overdose patients treated in the ER in a typical week			6.40	8.77	3	0, 40

^a Cells with size < 5 are not reported to protect confidentiality.

^b Some respondents held more than one degree/licensure.

3.2. ER staff awareness, support and enthusiasm for the MROT program

Awareness, support and enthusiasm for the MROT program among the ER staff were strong. After hearing a description of the program, 52% strongly agreed and 44% somewhat agreed that they understood the MROT program (Table 2). Ninety-two percent strongly agreed they were supportive of the program in their hospital, 84% strongly agreed they were enthusiastic about the program; 72% strongly agreed the program is very much needed by opioid overdose patients presenting in the ER; 76% strongly agreed the MROT program is good for opioid overdose patients presenting in an ER; and 64% strongly agreed the MROT program would result in improvements for opioid overdose patients presenting in an ER.

In the qualitative data, respondents' understanding of and support for the program was highlighted by expressions such as the following respondent's enthusiastic declaration upon hearing about the program, "I was kinda ecstatic about it [laughter]. I was like, 'Another tool for the tool box? I'll take it!' (15:10). Others reflected the idea that the MROT could provide more specialized services than are currently available, and would be considered supplemental to, rather than redundant with, existing services such as social work, case management, or specialized behavioral health teams:

"I think it would be better for the resource thing, just because it might be more persuasive than just talking to a social worker, especially if it's one of those people who is a repeat offender and has seen our social worker like eight thousand times."

(9:2)

3.3. Relative advantage

Relative advantage specifies the degree to which the innovation is perceived as being better than standard of care (SOC). We asked the respondents to compare the proposed MROT program to their current SOC, which in most cases was giving patients a referral sheet with contact information for community-based services. In the quantitative data, a majority (80%) of the ER staff strongly agreed that the MROT program was substantially better compared to SOC, and 68% strongly agreed the program would result in better outcomes for their patients. No respondents indicated disagreement with these statements (Table 2).

In the qualitative data, discussions focused on two areas in which the MROT might improve upon current SOC: (1) in the hospital and (2) among the patients. In the hospital, respondents discussed how the MROT could improve upon SOC by: reducing burden on staff, freeing

Table 2
Diffusion of Innovation attitudes, awareness, support, and enthusiasm for the mobile recovery outreach team (MROT) among emergency room staff (n = 25).

	N	%
Awareness, support, and enthusiasm:		
I'm supportive of the Mobile Recovery Outreach program in hospitals I work in.		
Strongly disagree	0	0
Somewhat disagree	0	0
Somewhat agree	2	8
Strongly agree	23	92
I don't think the Mobile Recovery Outreach program is good for opioid overdose patients presenting in an ER.		
Strongly disagree	19	76
Somewhat disagree	4	16
Somewhat agree	1	4
Strongly agree	1	4
I'm enthusiastic about the Mobile Recovery Outreach program in hospitals I work in.		
Strongly disagree	0	0
Somewhat disagree	0	0
Somewhat agree	4	16
Strongly agree	21	84
I don't expect the Mobile Recovery Outreach program will result in any improvement for opioid overdose patients presenting in an ER.		
Strongly disagree	16	64
Somewhat disagree	6	24
Somewhat agree	3	12
Strongly agree	0	0
The Mobile Recovery Outreach program is very much needed by opioid overdose patients presenting in an ER.		
Strongly disagree	0	0
Somewhat disagree	2	8
Somewhat agree	5	20
Strongly agree	18	72
I don't know what the Mobile Recovery Outreach program is about.		
Strongly disagree	13	52
Somewhat disagree	11	44
Somewhat agree	1	4
Strongly agree	0	0
Relative advantage:		
The MROT Program is a substantially better option for me than providing – or having another ER staff provide – patients with a referral sheet with treatment program contact information		
Strongly disagree	0	0
Somewhat disagree	0	0
Somewhat agree	5	20
Strongly agree	20	80
The MROT will result in substantially better outcomes for my patients than providing – or having another ER staff provide – patients with a referral sheet with treatment program contact information.		
Strongly disagree	0	0
Somewhat disagree	0	0
Somewhat agree	8	32
Strongly agree	17	68
Having my patients receive take-home naloxone through the Mobile Recovery Outreach program makes me feel more confident that they will survive a subsequent overdose.		
Strongly disagree	3	12
Somewhat disagree	2	8
Somewhat agree	8	32
Strongly agree	12	48
Complexity:		
It is or would be easy for me to refer opioid overdose patients to the Mobile Recovery Outreach program.		
Strongly disagree	1	4
Somewhat disagree	1	4
Somewhat agree	5	20
Strongly agree	18	72
The MROT is or would be less burdensome for me when treating opioid overdose patients compared to our current standard of care.		
Strongly disagree	0	0
Somewhat disagree	3	12
Somewhat agree	10	40
Strongly agree	12	48

Table 2 (continued)

	N	%
Referring patients to the Mobile Recovery Outreach program is or would be too complicated for an ER.		
Strongly disagree	16	64
Somewhat disagree	8	32
Somewhat agree	1	4
Strongly agree	0	0
The MROT does not integrate well with an ER's workflow.		
Strongly disagree	13	52
Somewhat disagree	9	36
Somewhat agree	2	8
Strongly agree	0	0
Don't know	1	4
Compatibility:		
The MROT is a good fit for an ER's needs.		
Strongly disagree	0	0
Somewhat disagree	0	0
Somewhat agree	5	20
Strongly agree	20	80
The MROT is consistent with my personal values.		
Strongly disagree	0	0
Somewhat disagree	0	0
Somewhat agree	4	16
Strongly agree	21	84
The MROT is consistent with my professional values		
Strongly disagree	0	0
Somewhat disagree	0	0
Somewhat agree	3	12
Strongly agree	22	88
The MROT is a good fit for opioid overdose patients' needs.		
Strongly disagree	0	0
Somewhat disagree	0	0
Somewhat agree	4	16
Strongly agree	21	84
The MROT works within an ER's workflow.		
Strongly disagree	0	0
Somewhat disagree	4	16
Somewhat agree	11	44
Strongly agree	10	40
I think it is a good idea for the MROT to give take-home naloxone to opioid overdose patients who are leaving an ER.		
Strongly disagree	0	0
Somewhat disagree	3	12
Somewhat agree	7	28
Strongly agree	12	48
Don't know	3	12
I trust the information the MROT provides to patients when they give them take-home naloxone.		
Strongly disagree	2	8
Somewhat disagree	3	12
Somewhat agree	7	28
Strongly agree	13	52

up beds for other more acute patients, reducing wait time in the ER, and preventing unnecessary admissions. Often, these benefits were overlapping and described simultaneously. For example, this respondent identified three potential benefits of introducing the MROT into the ER:

“I think they would speed up wait times and beds that are being taken away from medically acute patients and be able to provide maybe more resources than our team members are able to provide.” (1:5)

Another respondent highlighted how providing more specialized services by individuals knowledgeable in the field of substance use would reduce burden on staff, thus freeing them up to provide services for patients with more immediate trauma:

“I mean, just the fact that you're talking [about] providers that have read about overdoses and drug addiction in a textbook for nursing school, versus people who actually care and can put them in touch with the resources they need. It would save us a ton of time, like running around and trying to figure out the best resources for this

person when we're in the hospital and we could be focused on stabilizing traumas and people that are coming in and things that there aren't a lot of resources for...If we had that additional support to come, we would have a lot more time to focus on other things.”

(4:5)

Respondents perceived that the addition of the MROT could supplement existing staff in social work or case management departments, who were often over-burdened. The following two respondents also highlighted the difficulties in accessing substance use disorder treatment resources in the community, and conveyed a sense that a more specialized service for overdose patients might improve linkages to treatment:

“It might be nice to have a different face, a different group with more resources available, you know?”

(9:2)

“Our case management and social work team does a fabulous job, but I would say everybody's thin because of their workload. Case managers and social workers can try to make phone calls to get them places, but that's time intensive. It's, you know, again, they have thirty to forty-plus patients that they are trying to manage and discharge out and get durable medical equipment and home health and hospice and all these things. And to sit and just place phone calls for who's accepting, who can we get you in, do we need an appointment, oh just show up and that, a lot of times...I'm just speaking for just, from what I hear. I've not personally made that phone call, where those places will call and just say “Yeah, just show up. Give the patient our information and just have them come directly here.” Or something, and then again, whether they follow through or not...”

(12:14)

In the hospitals where our respondents worked, patients often spend several hours in the ER, especially if they need to wait to be seen by a specialist before being discharged. Because the MROT would be on-call and dedicated specifically to seeing opioid overdose patients, respondents perceived that this service could accelerate care:

“I think that it would speed up the process for people to get to treatment. It would speed up the flow of the ER, because they are not going to take up as many ER beds...A lot of the times, especially in the winter time, we have an abundance of patients come in that just clog up our system. You know, because we're waiting for placement. We're waiting for an evaluation. Stuff like that...The benefits of the [MROT] program would be a faster response team.”

(26:5-8)

Ultimately, respondents perceived that providing more specialized services to opioid overdose patients could reduce the overall burden on the ER system, even acting in a preventative manner to reduce future ER visits: “I think it may stop them getting to the ER and kinda slow down this huge overload that the ER's having” (10:16). One respondent anticipated that the effects of the MROT would be similar to a different mobile crisis team that already operates in their hospital for psychiatric patients:

“After the [crisis team] talks to them and says, ‘no, they are OK to be discharged. We think they can be discharged and be seen tomorrow.’ Then we will discharge them. Now that's somebody who would have been stuck in our ER for five days. Now they are not.”

(10:21)

In terms of the patients, respondents identified ways in which the MROT could provide patients with more options, more resources, and, ultimately, could improve patient outcomes:

“We're making them worse and we all know that. Everyone knows that. Nobody is deluded into thinking we are helping them in the ER.

Everyone knows we're making them crazier by just being stuck in a room. So having someone who can talk to them that would be beneficial. At least keeping them calmer and making them feel like they've been heard.”

(10:12)

“They come in and we don't really have, as a hospital, have a lot of support that we can give them. We treat them. We stabilize them. We tell them not to use drugs, but we don't really have anywhere to refer them to or anything that can get them, so I think a lot of the people that come in are pretty overwhelmed with the fact that they don't have anybody to reach out to, to get the help they need. We kind of just discharge them to the street, like ‘Don't come back, let's try to keep you off of that stuff.’ But we are not giving them the tools they need to stay off of it.”

(4:1)

“It's all about the patient, so it's really about that early intervention and stepping in and making sure they have the right resources and tools that they need to get help, if that's what they want. And if it's not what they want, at the time, at least [they know something is out there]. Yeah.”

(12:9)

“It would really help the nurses out, it would help social work, help the doctor out and if, you know, if they have any success in helping treating people we can maybe see a decrease in overdoses”

(8:6)

Respondents also suggested that the MROT could provide support for families and caregivers of the patients:

“Having access to an MROT, I feel like we could impact and talk to the family members and provide the resources that they need. A lot of the family members are at a loss. They don't know what to do. They don't know how to handle these situations. They come in and they're desperate. They're so heartbroken that their child has overdosed, or overdosed again.”

(14:8)

In the quantitative data, the ER staff were somewhat less enthusiastic (48% strongly agreed and 32% somewhat agreed) regarding their confidence that patients would survive a subsequent overdose because they received take-home naloxone through the MROT program (Table 2). Qualitative findings did little to elucidate this quantitative finding, but in Section 3.5 we discuss some qualitative results related to the compatibility of naloxone distribution within the ER.

In summary, respondents highlighted two domains in which the introduction of an MROT could improve upon SOC (i.e., relative advantage): in the hospital, by reducing burden on staff, reducing time in the ER, freeing up beds for more acute patients, and preventing unnecessary admissions; and among the patients and their families, by providing more options, more resources, and improving outcomes. However, simply perceiving that the innovation can improve upon SOC is rarely enough to catalyze adoption. Next, we discuss perceptions of how the MROT program would integrate into the ERs.

3.4. Complexity

Complexity represents the perceived difficulty in using the innovation (Sanson-Fisher, 2004). Table 2 shows that a majority (72%) strongly agreed that it is or would be easy for them to refer opioid overdose patients to the MROT program. Just under half (48%) strongly agreed and 40% somewhat agreed that the MROT program would be less burdensome for them when treating opioid overdose patients compared to the current standard of care. Finally, 52% strongly agreed the MROT program integrates well into the ER's workflow and 64% strongly agreed it would not be too complicated to refer patients to the MROT program.

The qualitative data help explain why only half of respondents strongly agreed that the program would integrate well, by describing anticipated logistical issues related to integrating the MROT program (i.e., where, when, and how the program could integrate into existing structures). For the most part, ER staff suggested that the MROT would be most effective if it were available: (1) quickly, so patients did not have to wait or be retained in the ER; and (2) upon medical stabilization, when patients are out of immediate danger and sufficiently coherent to engage. In terms of timeliness, staff expressed the need for the MROT to engage with patients before they left the ER:

“Often times these people, especially if it’s not intentional, they will get Narcan, they will feel awake, they are upset, and they want to leave. So to have them hoarded there for hours might sometimes be a challenge.”

(7:13)

Concerns were raised about some logistical issues that would need to be addressed prior to implementation. These included: (1) how the team would be summoned and the potential for creating extra work, (2) experience of opioid withdrawal symptoms and the degree to which patients would need to be “sober” versus simply medically stable, and (3) patient confidentiality and consent.

Various models for how the team could be summoned were suggested, including having the call made by physicians, nurses, unit secretaries, or an automated system within the hospital’s electronic health record (EHR). Though rare, some respondents expressed concern that making another phone call to the team could increase the workload of already over-burdened ER staff:

“Maybe at first there would be push back from certain physicians who would think it was just, you know, just one more thing they have to do. Because, you know, everyone is so burned out on these, on these opioid crisis things. We’re all so burned out because we see it so much.”

(10:19)

Some respondents suggested that a patient would need to be “100% sober” before engaging with the team, while others suggested that the patient would only need to be “alert and oriented.” Others expressed concern related to the severity of opioid withdrawal symptoms that an opioid dependent patient might be experiencing subsequent to an overdose reversal, and advised timing the arrival of the team with sensitivity to that potential:

“It’s also a case by case thing. If the patient is going through withdrawals, then absolutely not. That’s not the time to send anybody else in there. That’s the time to get them comfortable and, you know, get them more stable.”

(8:4)

The concern about withdrawal symptoms led some ER staff to suggest that the MROT intervention might be better received once the patient was admitted into the inpatient ward, rather than in the ER itself. Though rare, some respondents also cautioned about the possibility of violent or aggravated responses by patients experiencing severe opioid withdrawal.

One respondent expressed concerns related to the need to ensure patient privacy and confidentiality:

“But, I mean, so I think the biggest obstacle would be, um, privacy and patient con—comfortability, but I think giving the unit, getting the mobile response team involved the second the patient is able to verbalize and participate in the plan of care.”

(24:1)

This respondent suggested that processes would need to be established to ensure that the hospital could ethically share information with the teams. Relatedly, another respondent raised the issue of when and how the hospital would obtain patient consent to engage with the

MROT.

3.5. Compatibility

Compatibility represents the degree to which the innovation is compatible with the culture, values, and needs of the potential adopters and the organization (Sanson-Fisher, 2004). A majority (80%) of the ER staff strongly agreed the MROT program is compatible with the needs of the ER, 84% strongly agreed the program is consistent with their personal values, and 88% strongly agreed the program is consistent with their professional values. A majority (84%) of the ER staff also strongly agreed the MROT program is a good fit for opioid overdose patients’ needs. No respondents disagreed with these statements. The ER staff were less enthusiastic (44% somewhat agreed and 40% strongly agreed) regarding how well the program fits within the ER’s work flow. ER staff also indicated some doubt that it was a good idea for the MROT program to give take-home naloxone to opioid overdose patients when discharging them from the hospital (28% somewhat agreed, 48% strongly agreed, and 12% didn’t know). Finally, not all ER staff were in strong agreement that they trusted the information the MROT program provides to patients when they give them naloxone to take home (28% somewhat agreed and 52% strongly agreed).

In terms of cultural compatibility, many respondents identified the underlying conflict between the culture and capacity within the ER and the needs of opioid overdose patients. While ERs are designed to address acute medical emergencies, and therefore are equipped to provide life-saving measures for patients presenting with opioid overdose, the underlying chronic condition of opioid use disorder requires a type of care that cannot be provided by the emergency medical system. This conflict creates challenges for emergency medical providers, as illustrated below:

“It’s hard to treat these people and know that you’re ultimately not fixing the problem. You are saving their life, but you are not preventing this from happening again. So psychologically, I think it would help ER staff knowing that not only are we stabilizing that person, but we are helping them in the long term. Because it does contribute to burnout, when you see the same people with the same problems coming back over and over again.”

(7:11)

“Every ER doc that I work with understands that we’re getting killed, we’re getting our butts kicked by this crisis and the stuff that needs to change, we can’t fix in the ER. So it’s time to start changing how the ER works...Instead of us trying to fiddle our way through talking to these people about, you know, we say the same thing, ‘You gotta quit. You gotta quit doing heroin.’ And they’re gonna go, ‘OK. Alright. Cool.’ We know they’re not, you know? We don’t know what to say, so we would just love to, just all the ER docs and all the ER nurses, I think they would love to just say, ‘Yeah, call the mobile team and have them come and deal with this because we don’t know how to’.”

(10:10)

Introducing a service into the ER that can provide the type of specialized care to help opioid overdose patients reduce risks and access substance use disorder treatment services, when appropriate, was viewed as an intervention that could help alleviate this conflict and bring treatment protocols more in line with the personal and professional values of the ER staff.

Similar to the findings reported on relative advantage, qualitative data did little to elucidate the respondents’ concerns related to naloxone distribution via the MROT. Three respondents mentioned concerns related to the belief that providing naloxone can create an enabling environment for ongoing drug use. In the quote below, one respondent qualified that this opinion was one they heard expressed by others and did not necessarily hold themselves:

“The only think I've heard similar to [the MROT] is that, with the Narcan, they're trying to get it to more places...And I don't know if this would be similar and I hear a lot of people saying, I hear a lot of medical staff being against that. 'Cause they're saying we're basically...just giving them like a safety net, you know? They're never going to change if they know they can always just go to the needle exchange and get some Narcan, or have [the police] show up and give them Narcan. Then they are never going to get better. So I hear that problem a lot, but I'm not, I don't think it really relates to this, so much, because this isn't a Narcan program. This is like a program, like a...opioid program that's just got Narcan attached to it.” I don't think this is like a Narcan program, but I hear a lot of staff be very against a Narcan program”

(10)

Qualitative information about the degree of trust that ER staff have in the information about naloxone provided by the MROT was not systematically collected. However, some comments made during the quantitative portion of the interview suggested that respondents simply wanted to know more about the kind of information that would be provided before they would be able to express stronger support.

4. Discussion

MROT is a promising model for linking opioid overdose patients to services, though research regarding their implementation is quite nascent (Powell et al., 2019). Our findings suggest that ER staff in our sample overwhelmingly support the implementation of MROT program in the hospitals where they work. Using Diffusion of Innovation (DOI) Theory, we identified ways in which ER staff perceive that the MROT program could provide important advantages relative to the current SOC, identified logistical issues related to program complexity that should be addressed to optimize implementation, and highlighted areas in which the program is more and less compatible with the culture, values, and needs of the ER and its patients.

In terms of relative advantage, we asked respondents to compare the program to the current SOC, which is typically providing a referral sheet listing available community resources. Quantitative data suggested that most respondents thought the program was a better option than SOC, and many thought it would result in better outcomes for their patients. Qualitative data added to our understanding of SOC by identifying the availability of other resources in the ER, including case managers, social workers, and other specialized crisis teams. Even in the presence of those additional resources, respondents suggested that the MROT program could confer benefits for the ER environment, the hospital staff, and the patients and their families. For example, ER staff believed the addition of the MROT in the ER would allow staff to triage overdose patients to more specialized and timely care once the patients were stabilized, thus allowing ER staff to focus on patients who needed care that only they could provide. They also suggested that the MROT could provide additional support for patients' families. Providing coping and social support resources for family members is an important part of comprehensive interventions to reduce the harms associated with substance use (Orford, Copello, Velleman, & Templeton, 2010). Our findings reflect those from the early implementation of the Opiate Overdose Prevention Strategy Emergency Department Project (OOPS ED), implemented in 1997 in Western Australia. That program was premised on the idea that an ED-based program for opioid overdose patients could improve cooperativeness among, and support for, both overdose patients and staff (Davidson, 1999), and early acceptability research suggested that ER staff believed the program would confer benefits to the patients above what was already available.

Although still generally viewed favorably by the ER staff, there were some concerns about the complexity of integrating the MROT protocol into the ER procedures, which could negatively affect adoption of the program (Rogers, 1995). Concerns in this area are understandable,

given that the successful implementation of this program will require planning and protocol development, as well as integration into existing ER procedures. However, for many hospitals this might be a relatively simple switch from handing patients a referral sheet to making a phone call to the MROT hotline – a call that could also be made by case management or social work staff. Integration of the procedure into hospital EHR systems could also help routinize use of this program, and consistent use of the program could increase comfort and ease of use. Systematic reviews of the utilization of health information technology such as EHRs found that their use can increase adherence to protocol-based care, and may improve efficiency and level of patient care (Chaudhry et al., 2006; Keasberry, Scott, Sullivan, Staib, & Ashby, 2017). Computerized decision support systems, which integrate patient information and provide support for provider decision making, could be programmed to provide alerts or prompts when a call to the MROT would be recommended, though empirical evidence supporting the impact of these systems on quality of care is somewhat weak (Black et al., 2011). And, a risk of these systems is that they can increase the demand on providers' time (Black et al., 2011), a concern that was also raised in our study. Therefore, integration into hospital EHRs should be informed by formative research. On the other hand, if this strategy were successfully established, the MROT program could be perceived even more positively by ER staff because it could remove some uncertainty regarding procedures to follow when an overdose patient presents in the ER. This might prove especially beneficial in lower-volume hospitals, where use of the program will be more sporadic.

Another logistical issue that highlighted the complexity of integrating the MROT into the ER environment included concerns related to opioid withdrawal symptoms. For opioid dependent people, reversal of an overdose with naloxone can precipitate withdrawal symptoms including nausea, vomiting, agitation, and flu-like symptoms. Some respondents expressed concerns related to patients' willingness and ability to engage with the team while experiencing opioid withdrawal symptoms. Because the experience of opioid withdrawal symptoms can be quite uncomfortable, this observation problematizes the notion that the moments immediately following an overdose are “teachable moments” (McBride et al., 2003), if the patient is not sufficiently comfortable or attentive enough to engage with the intervention immediately following medical stabilization. While other criteria for the idea of a teachable moment may be met for some individuals (i.e., increased perception of risk, strong emotional response, changes in self-concept), timing the intervention to ensure that patients are comfortable and receptive will be critical to success. One solution to this problem could be an ER-based buprenorphine program. Evidence is emerging that initiation of buprenorphine treatment in the ER can decrease acute withdrawal symptoms, improve treatment outcomes, and protect against subsequent overdose (Berger, 2015; D'Onofrio, O'Connor, Pantalon, et al., 2015; Love, Perrone, & Nelson, 2018). A low-threshold ER-based buprenorphine program could help alleviate withdrawal symptoms while patients are in the ER, even those precipitated by short-acting naloxone. This, in turn, could improve patients' wellbeing and subjective experiences in the ER, facilitate more positive interactions with healthcare providers, and enhance subsequent linkage to long-term MAT.

ER staff were decidedly less enthusiastic about the overdose education and THN component of the intervention. While few respondents spoke about their concerns at length, three people expressed the perception that providing THN creates an environment wherein the consequences of continued opioid use are lessened. The first THN program in the US was established by Dan Bigg and the Chicago Recovery Alliance in 1996 (Maxwell, Bigg, Stanczykiewicz, & Carlberg-Racich, 2006). As of 2014, over 152,000 individuals, nearly all people who use drugs, have been trained in overdose prevention, recognition, and response (Wheeler et al., 2015). Research has found that individuals trained in overdose prevention report less drug use and increased drug treatment attendance (Jones, Campbell, Metz, & Comer, 2017; Seal

et al., 2005; Wagner et al., 2010). In 2018, the US Surgeon General Jerome Adams issued an advisory that all Americans who have the potential to experience or witness an opioid overdose carry naloxone. Our findings suggest that educational and academic detailing efforts are required, and should focus on increasing the confidence among ER staff that THN and the information provided by MROT can be an effective and lifesaving intervention for opioid overdose patients.

Overdose survivors are encouraged to seek medical attention following an overdose to ensure the return of respiration and absence of complications. However, negative attitudes towards people who use drugs can serve as a barrier to successful interactions in the health care setting (van Boekel, Brouwers, van Weeghel, & Garretsen, 2013). When held by health care professionals, negative attitudes often emerge from experiences caring for patients perceived to be difficult or complicated, and can also be explained by stigma and lack of knowledge about patients with substance use disorders (van Boekel et al., 2013). Stigma has also been described as a barrier to implementing law enforcement-based post-overdose outreach programs (Formica et al., 2018). Our findings suggest the demand on ER staff created by increasing overdose events can result in frustration and burnout among emergency medical providers, who are treating an unprecedented number of opioid overdoses yet are not always equipped to address the underlying chronic conditions of dependence and addiction experienced by many opioid overdose patients. The MROT program could reduce impacts on ER staff, both in terms of workflow and emotional burnout, by providing resources to supplement what is available in the ER. The potential for the MROT program to help patients avoid future overdoses was also highlighted as a benefit by respondents.

To further address negative attitudes, implementation of the MROT program could be accompanied by cultural competence and stigma reduction training. Topics for such training could focus on encouraging ER staff to use person-first language (e.g., “person with an opioid use disorder”) rather than language that increases stigma like “addict”. Recent research found that terms like “substance abusers” and “opioid addict” were associated with negative explicit bias (Ashford, Brown, & Curtis, 2018). Building upon those findings, the authors went on to find that stigmatizing terms have the potential to influence medical personnel and their perceptions of individuals with substance use disorders (Ashford, Brown, McDaniel, & Curtis, 2019). Subtle changes to language that reduce stigma might be especially impactful in this setting, as ER staff may be the first health professionals an overdose patient encounters. Including visual reminders, such as infographics, to serve as reminders of preferred terms could help create sustainable change within the health care setting. While research cannot yet definitively show that simply using non-stigmatizing language decreases negative explicit and implicit bias (Ashford et al., 2018), efforts to use affirming language in personal and written communications regarding individuals with substance use disorders have the potential to improve the experience for both ER staff and patients.

4.1. Limitations

Our findings represent the opinions of a small convenience sample of ER staff in a mostly rural state in the Mountain West. Of note, our sample was comprised of mostly nurses – a group that might be more amenable to the type of intervention described in our study. Therefore, these findings may not generalize to more urban communities or other ER staff, though our conclusions do mirror those of other early implementation research (Davidson, 1999). Our quantitative analyses were solely descriptive and the small sample size precluded hypothesis testing, though our mixed methods approach strengthened our ability to describe this complex phenomenon by integrating qualitative data describing the respondents' attitudes and beliefs about the program. A further limitation is that the respondents had not yet had the opportunity to experience the MROT program, and were responding to our brief and somewhat general description of it when assessing its relative

advantage, complexity, and compatibility. The fact that 48% of respondents indicated some ambivalence about whether they knew what the program is about suggests that additional information should have been provided to ensure understanding. However, this study was conducted prior to full implementation, so it was impossible to provide a more detailed description because the program was still being codified. Additionally, details of program logistics will be tailored to each hospital, so the exact configuration of the program may be slightly different as it rolls out. Opinions and attitudes may change after ER staff have an opportunity to interact with the program, especially if it evolves beyond what was described in the current research. Nonetheless, these findings provide evidence that there is support for the general idea, and may provide an important starting point for informing implementation in this and other communities.

5. Conclusion

As the North American epidemic of opioid-related deaths continues, effective implementation of comprehensive strategies for reducing the risk for overdose death is urgently needed. For those people who are ready and willing to access treatment, these strategies must include not only support for and linkage to MAT, but also social support and referral to other services such as housing assistance and behavioral health care. Ensuring that people at risk for opioid overdose death are equipped with naloxone and educated about how to reduce their risk is a critical component of a national strategy to address this crisis. Findings from this project suggest that implementation of an STR-funded ER-based intervention for opioid overdose patients would receive strong support from ER staff, who perceive that it would confer significant benefits to the hospital, the staff, and the patients. Implementing such an intervention in the ER could help alleviate stress and burnout among emergency medicine providers, many of whom acknowledge that the underlying, chronic problem of opioid use disorder cannot be solved using the current set of tools available in the ER. Lack of confidence in or support for take home naloxone and other logistical issues related to the implementation of such an intervention should be addressed early and should be informed by implementation theory and formative evidence.

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Author contributions (we use the CRediT Taxonomy to determine authorship contributions)

KW: Conceptualization of the research idea, acquisition of funding (PI), design of methodology, supervision (overseeing research activities and execution), formal analysis (qualitative), writing (original draft, review and editing).

KS: Data curation (maintaining and coding data), interview collection, project administration (management and coordination for project activity planning and execution), resources (providing study instrumentation), writing (review and editing)

RH: Investigation (interview collection), formal analysis (quantitative), data curation (maintaining and coding data), interview collection, project administration (management and coordination for project activity planning and execution)

AD: Investigation (interview collection), formal analysis (qualitative)

ML: Acquisition of funding (Co-I), writing (review and editing),

SW: Acquisition of funding, conceptualization of the research idea, supervision, writing (review and editing)

MB: Acquisition of funding, conceptualization of the research idea, supervision, writing (review and editing)

NR: Acquisition of funding, conceptualization of the research idea, supervision, writing (review and editing)

RO: Acquisition of funding (Co-I), design of methodology, formal analysis (quantitative), writing (original draft, review and editing)

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