ORIGINAL RESEARCH

Challenges and Opportunities to Engaging Emergency Medical Service Providers in Substance Use Research: A Qualitative Study

Allysha C. Maragh-Bass, PhD, MPH;[1] Julie C. Fields, MPH;[2] Junette McWilliams, MPH;[2] Amy R. Knowlton, ScD, MPH[2]

1. Center for Surgery and Public Health, Brigham and Women's Hospital, Harvard Schools of Medicine and Public Health, Boston, Massachusetts USA
2. Johns Hopkins Bloomberg School of Public Health, Department of Health, Behavior and Society, Baltimore, Maryland USA

Correspondence:
Allysha Maragh-Bass, PhD, MPH
The Lighthouse Studies at Peer Point
Department of Health, Behavior, Society
Johns Hopkins Bloomberg School of Public Health
2213 McElderry Street, 2nd floor
Baltimore, Maryland 21205 USA
E-mail: arobin52@jhu.edu

Conflicts of interest/funding: This study was supported by grants from the National Institutes of Health (Bethesda, Maryland USA; R01 DA019413 and R34 DA034314). This research also was supported by the Johns Hopkins Center for AIDS Research (Baltimore, Maryland USA; 1P30AI094189). The authors declare no conflicts of interest.

Keywords: Emergency Medical Services; health care utilization; minority health; socioeconomic status; substance use; urban health

Abbreviations:
ALS: Advanced Life Support
BCFD: Baltimore City Fire Department
BLS: Basic Life Support
ED: emergency department
EMS: Emergency Medical Services
JHSPH: Johns Hopkins Bloomberg School of Public Health
NAM: National Academy of Medicine

Received: February 7, 2016
Revised: June 17, 2016
Accepted: July 10, 2016

Online publication: January 26, 2017

doi:10.1017/S1049023X16001424

Abstract

Introduction: Research suggests Emergency Medical Services (EMS) over-use in urban cities is partly due to substance users with limited access to medical/social services. Recent efforts to deliver brief, motivational messages to encourage these individuals to enter treatment have not considered EMS providers.

Problem: Little research has been done with EMS providers who serve substance-using patients. The EMS providers were interviewed about participating in a pilot program where they would be trained to screen their patients for substance abuse and encourage them to enter drug treatment.

Methods: Qualitative interviews were conducted with Baltimore City Fire Department (BCFD; Baltimore, Maryland USA) EMS providers ($N = 22$). Topics included EMS misuse, work demands, and views on participating in the pilot program. Interviews were transcribed and analyzed using grounded theory and constant-comparison.

Results: Participants were mostly white (68.1%); male (68.2%); with Advanced Life Skills training (90.9%). Mean age was 37.5 years. Providers described the "frequent flyer problem" (eg, EMS over-use by a few repeat non-emergent cases). Providers expressed disappointment with local health delivery due to resource limitations and being excluded from decision making within their administration, leading to reduced team morale and burnout. Nonetheless, providers acknowledged they are well-positioned to intervene with substance-using patients because they are in direct contact and have built rapport with them. They noted patients might be most receptive to motivational messages immediately after overdose revival, which several called "hitting their bottom." Several stated that involvement with the proposed study would be facilitated by direct incorporation into EMS providers' current workflow. Many recommended that research team members accompany EMS providers while on-call to observe their day-to-day work. Barriers identified by the providers included time constraints to intervene, limited knowledge of substance abuse treatment modalities, and fearing negative repercussions from supervisors and/or patients. Despite reservations, several EMS providers expressed inclination to deliver brief motivational messages to encourage substance-using patients to consider treatment, given adequate training and skill-building.

Conclusions: Emergency Medical Service providers may have many demands, including difficult case time/resource limitations. Even so, participants recognized their unique position as first responders to deliver motivational, harm-reduction messages to substance-using patients during transport. With incentivized training, implementing this program could be life- and cost-saving, improving emergency and behavioral health services. Findings will inform future efforts to connect substance users with drug treatment, potentially reducing EMS over-use in Baltimore.

Maragh-Bass AC, Fields JC, McWilliams J, Knowlton AR. Challenges and opportunities to engaging Emergency Medical Service providers in substance use research: a qualitative study. *Prehosp Disaster Med*. 2017;32(2):148-155.

Introduction

Recent estimates suggests that over-utilization, referring to high-frequency use, misuse, and non-emergent use, of Emergency Medical Services (EMS) is increasing in

the United States.[1-3] In the past two decades, annual emergency department (ED) visits and medically unnecessary EMS transports have increased, with annual ED visits rising beyond what would be expected based on population growth.[4-7] Annual costs of medically unnecessary transports since 1997 are estimated at a minimum of US $200 million.[8-10] In response, the National Academy of Medicine (NAM; Washington, DC USA), which provides evidence-based research and recommendations for public health and science policy, issued a call for evidence-based practices in EMS, and also identified a critical need for rigorous prehospital emergency care research.[1,11] Specifically, the NAM noted that much of the protocols implemented by EMS are informed by research conducted in hospital settings, and that systems-level barriers have prevented the conduct of research in prehospital settings.[1,11]

EMS Over-utilization and Misuse in Urban Settings

Extant research suggests EMS misuse and over-use varies by demographic factors. For example, studies have identified that EMS misuse and over-use is seen frequently among elderly patients and patients with psychiatric conditions and/or substance dependence.[12-17] Recent studies also suggest that higher rates of medically unnecessary EMS transports occur in urban cities, and often are due to a small percentage of patients comprising a large percentage of individual transports.[18-23] Similarly, a recent study by Ondler and colleagues found that frequent ED users accounted for 10 times the amount of visits as infrequent users at an urban academic hospital, and that they were often unemployed, under-insured, and had behavioral health conditions such as substance abuse.[6] A recent qualitative review by Rees and colleagues also found that the majority of the patients in the studies they examined had mental illness issues, which ED providers were unable to adequately care for.[19] Other studies corroborate these findings, such that in resource-limited communities, much of the population using EMS services is under-insured, racial/ethnic minorities, homeless individuals,[24] and those with limited access to other health care and social services, such as substance treatment programs.[25-28]

To date, little research has distinguished between demographic characteristics of frequent EMS versus frequent ED users. The research that has been conducted suggests that frequent EMS users are often under-insured, racial/ethnic minorities, particularly in urban settings.[27-34] Conversely, a recent national study by Pines and colleagues suggest that ED frequent users are more likely to be white American and female, many of whom are insured.[35,36] Therefore, more research is needed to characterize EMS over-use as distinct from ED use, as well as the magnitude of behavioral health conditions on patterns of health care utilization.

Engaging EMS and Conducting Research in Urban Settings

Recently, studies identifying factors to understand and mitigate use of emergency services have been conducted.[37,38] However, many of these studies have been conducted in the ED rather than with EMS providers.[37-43] Irrespective of intervention type, important facilitators identified include demonstrated effectiveness of screening and health interventions and study "champions" to maintain the impact of the interventions.[1,1T,37-41] Among studies of research in out-of-hospital settings, a major barrier identified is lack of knowledge of ethical research standards, such that participants may not be aware of institutional safeguards to protect privacy and ensure maximum benefits.[39] Alternatively, a facilitator of prehospital research is incorporation of study elements into existing EMS workflow and protocols, though more research is needed in prehospital settings to identify factors which facilitate research.[40,43-45]

As mentioned, an important area for further EMS research is understanding the impact of substance use on medically unnecessary transports, particularly in resource-poor urban settings. Baltimore City (Maryland USA), characterized by both EMS and ED over-use, is an urban area where much can be gleaned from engaging EMS in research to inform evidence-based prehospital care.[27,29,34] An estimated one in eight adults are heroin-dependent, and as a result, the city has the highest national prevalence of heroin use and drug-related mortalities.[46-48] Within EMS, longer wait times due to non-emergent substance use may be contributing to these issues. Previous research by Knowlton and colleagues found that frequent EMS utilizers in Baltimore City are usually middle-aged, African-American males, many of whom utilize EMS due to non-emergent alcohol and/or opiates use.[27,29] Despite high rates of substance use and medically unnecessary EMS transports, no prehospital interventions to address these factors have been conducted in Baltimore to date.

As a result, the Johns Hopkins Bloomberg School of Public Health (JHSPH; Baltimore, Maryland USA) and Baltimore City Fire Department (BCFD) formed a partnership to test a novel prehospital intervention program. Emergency Medical Service providers will be trained to screen patients for substance abuse, deliver motivational messages to encourage patients to enter drug treatment, and refer clients to the JHSPH study site for active treatment referral. While brief alcohol dependence screenings and interventions have been shown effective, additional research is needed to test this approach in opiate-using populations.[49-53] Therefore, the present partnership is critical to identifying novel ways to reduce EMS misuse and over-use in an urban, resource-limited setting.

Summary and Purpose

Currently, there is a dearth of research identifying approaches to reduce over-utilization of EMS, including understanding the needs and current practices of EMS providers. In urban cities such as Baltimore, EMS providers have direct contact with marginalized individuals, many of whom are substance users. The partnership between the JHSPH team and BCFD was borne of the need for prehospital, evidence-based recommendations to inform standards of care for substance-using populations. The purpose of the present formative research was to understand the contextual factors associated with EMS care provision for substance-using populations in Baltimore City. Specific study objectives were to: (a) explore providers' views on EMS over-use; (b) understand the demands of providers caring for substance-using patients; and (c) gain insights from EMS providers on participating in the implementation of the intervention. Findings will inform EMS training and implementation of the larger intervention study.

Methods

EMS System in Baltimore City

In Baltimore City, the EMS system is operated by the BCFD. The catchment area of EMS is roughly 80 square miles, with a resident population of over 640,000 individuals.[27,54] Previous research suggests that the BCFD responds to approximately 235,000 calls every year.[54] The BCFD operates EMS out of 38 fire stations located throughout Baltimore City. Staffing regulations

https://doi.org/10.1017/S1049023X16001424 Published online by Cambridge University Press

require that each engine and truck are equipped with at least one EMS provider (eg, emergency medical technician or paramedic). Each engine is equipped with Basic Life Support (BLS) and Advanced Life Support (ALS) equipment, respectively, and EMS providers who are either BLS and/or ALS trained.[27,54] Current regulations employ a universal access mandate, such that all individuals requesting access to EMS must be cared for.

Study Design

The present research was the formative phase of the LADDER to Recovery study. In this first phase, semi-structured, qualitative, in-depth interviews were conducted with EMS providers. Their insights will inform Phase II, during which a training of EMS providers to briefly screen their patients for substance abuse and refer them to treatment programs will be conducted. Finally, Phase III will consist of collaboration with local treatment programs to verify the admission of patients referred by the JHSPH study site. Qualitative health research defines meaning through rich description, as compared to quantitative approaches which deductively summarizes.[54,55] Recently, it has been used increasingly to explore the insights of EMS personnel on various health issues.[11,40-43,56,57] Therefore, it was ideal for Phase I of the study.

Study Setting and Population

Interviews were conducted between April and June of 2013 at a centrally located fire station in Baltimore City. In order to accommodate the schedules of the providers, all interviews were completed prior to the beginning of the EMS providers' scheduled shift time. Interviews were conducted in private rooms of the station utilizing a semi-structured interview guide. The LADDER study is the result of an existing partnership between the study team and the fire department which oversees EMS in the area. Therefore, recruitment of EMS providers for this study was facilitated by the fire department leadership. Recruitment was implemented using a three-step protocol. Step One consisted of identifying trends of EMS use in Baltimore, to identify the two fire stations that are in the catchment area of the academic institution's hospital, which is located in a predominantly low-income area of the city. Step Two consisted of internal memos circulated by the fire department on behalf of the study team, which explained the project and solicited participation from EMS personnel. Interested persons were given the study contact information. Finally, in Step Three, the study team followed-up with these individuals, giving them more information about the study, answering their questions, and scheduling interviews.

Study Protocol and Measures

Written consent was obtained from all participants at the beginning of the interview. The principal investigator and three trained research team members conducted interviews with EMS providers. First, demographic information was obtained from each provider (eg, age, race, and number of years of experience). Next, perceptions of substance users and opinions about EMS playing a role in linking them to drug treatment services were elicited. The comprehensive interview guide was developed by the study team members to elicit rich description of the providers' perceptions (Appendix A; available online only). Previous research suggests that alcohol and opioids are most commonly used in Baltimore; thus, these substances were the only ones discussed. Interviews were either conducted one-on-one or as dual interviews so that partners could participate at the same time to ease their shift scheduling. Interviews lasted up to one hour and ended if providers were called to duty. All study procedures and materials were fully approved by the JHSPH Institutional Review Board.

Data Analyses

Completed interviews were professionally transcribed verbatim and coded by three researchers using grounded theory and constant comparison methods. Grounded theory is an approach whereby data are inductively analyzed to derive theory through social context.[54,58] Constant comparison is the means by which data analysis is iterated upon, thereby forming the grounded theory.[54,58] Its consists of three stages: (1) open coding, when tentative codes are assigned to summarize text; (2) axial coding, to identify relationships between the open codes; and (3) selective coding, during which the data are distilled to a single variable, thereby forming the grounded theory.[54,58] The research team met multiple times throughout the coding process to achieve consensus coding and inter-coder consistency for all transcripts. Once thematic saturation was reached, interviews were discontinued and the codebook was finalized. Coded text was then analyzed for recurrent themes and salient quotes were extracted. Analyses were conducted in Atlas.ti 7.0 (Atlas.ti Qualitative Data Analysis and Research Software for Windows, Version 7.0; Berlin, Germany: 2012).

Results

Participants

A total of 22 EMS providers were interviewed; Table 1 reports the demographic factors by sex. Among both males and females, the majority had Advanced Life Skills training (86.7% vs 100.0%, respectively). Males and females also were mostly White (66.6% vs 71.4%, respectively). On average, males were younger than females (36.1 vs 40.4 years, respectively). Most also had extensive experience, irrespective of sex; mean experience level was 8.7 years.

Themes

Four themes, summarized below, depicted views of EMS usage in Baltimore, the roles of providers, and recommendations to inform the intervention. Table 2 summarizes salient quotes.

Theme 1: Provider Perspectives on the use of EMS—Providers talked about the frequent over-use and misuse of EMS in Baltimore, where over-use refers to frequent users and misuse refers to non-emergent cases. Colloquially referred to as "the frequent flyer problem," many providers stated that this issue was both system-wide and a day-to-day challenge. Additionally, providers expressed frustration with misuse of EMS resources because non-emergent substance calls detain them from actual emergent cases:

> "It's overwhelming. Because there's been times when I have had a regular, and there's nothing wrong with them, other than they're drunk. And literally, there's a call literally around the block for a child. There was a child in cardiac arrest. And I've said to them, 'You realize there is a child that is dying around the corner, and I'm dealing with you.' They don't care. No care, no concern whatsoever. And I can't leave them, because they're not refusing service. And here's this child that is in need of immediate care, and I'm unavailable. So, that gets frustrating."

https://doi.org/10.1017/S1049023X16001424 Published online by Cambridge University Press

Characteristic	Males (*N* = 15) *N* (%)	Females (*N* = 7) *N* (%)	Total (*N* = 22) *N* (%)
Race/Ethnicity			
White (non-Hispanic)	10 (66.6)	5 (71.4)	15 (68.1)
Black (non-Hispanic)	3 (20.0)	2 (28.6)	5 (22.7)
Hispanic	1 (6.7)	0 (0.0)	1 (4.6)
Other	1 (6.7)	0 (0.0)	1 (4.6)
Life Skills Training			
Advanced	13 (86.7)	7 (100.0)	20 (90.9)
Basic	2 (13.3)	0 (0.0)	2 (9.1)
Experience (mean years)	7.3	11.7	8.7
Age (mean years)	36.1	40.4	37.5

Table 1. Demographic Characteristics of Participants

Several noted that mental illness and homelessness were prevalent, and that the structure of the local health care delivery resources contributed to EMS misuse and over-use. As a result, patients misuse EMS due to limited access to other medical and social services:

> "It's the middle of January and they're not high and they're homeless and they're hungry and lonely, tired, you know that kind of thing. [So] they want to get off the street they want to go to the hospital for a few hours to get warm."

Finally, providers described that many EMS over users were older adults:

> "Shockingly, they're older. Yeah, on Fridays and Saturdays we get the partying kids because we have [Federal] Hill in our area, but on most occasions, they're late 40 s all the way up into the 80 s. Yeah, very rarely are we picking up 35-year-olds that are falling down drunk all the time. I mean, we get those on the weekends but they're typically once and never see them again. But the ones that we're picking up over and over and over are late 40 s…. And I've had them up into the 80 s, but probably late 60 s, early 70 s is usually that frame. A lot of them are veterans [too]."

Theme 2: Challenges and Demands of being an EMS Provider—Providers expressed challenges in two main areas of their work: internal and external demands placed on them. External demands refer to their collective disappointment with the local health care delivery system. Providers stated that because of resource limitations and budget cuts in both the BCFD and the city at large, the quality of care delivery suffers. As a result, patients' needs, including substance users, are not being met, reducing team morale and thereby leading to burnout:

> "Yeah, I mean that's our biggest gripe as a department…. There's just no resources to fix all these people [patients misusing EMS]. There's just no way…."

Similarly, providers expressed frustrations with the inadequate substance treatment programs in the area. They cited long wait times to get appointments for patients and the lack of follow-up after patients are seen in an ED and/or undergo inpatient detoxification:

> "As far as availability of detox long-term treatment, you know you can take somebody to the hospital where they might spend two or three days, they're going to be right back out the same because there's no follow-up."

A few providers discussed what they believed to be differences in availability of drug treatment resources based upon socio-economic status. They suggested that those of lower socio-economic status – the majority of their patient population – had limited access to rehabilitation programs that may be more effective for recovery:

> "I think it's… segregated by your socioeconomic, you know, most people in the areas we serve in our communities are pretty much stuck in a culture of poverty. They can't support Suboxone so they [go to] the methadone clinics, the type where they have to report every day. You know that can be difficult. So, they miss doses."

Finally, internal demands refer to the challenges providers faced within their organizational culture and administration. Some providers expressed disappointment that they were not always given the opportunity to contribute to decisions that directly impact their daily responsibilities and tasks, which are often already time- and resource-limited:

> "The problem that we probably run into the most is that ____ would come up with these grand ideas but not include us in the decision-making process, they'll just come out with it and say here do it. Not give us any background or what's actually going on."

Theme 3: Facilitators and Barriers to Study Participation and Outcomes—While participants were not asked specifically about facilitators and barriers, several of these over-arching themes emerged from data analysis. First, a facilitator identified was the potential influence EMS providers have with their usual

https://doi.org/10.1017/S1049023X16001424 Published online by Cambridge University Press

Theme	Quote
Provider Perspectives on the Use of EMS	"I'm saying that it's the bulk of the work when you're dealing with drunks. I'm saying that when it's on the news that five people get shot in one spot, but you don't have enough medic units because you're dealing with something you don't need a medic unit for." "There's no reason for you to go back because you prefer the hospital more than you prefer this homeless shelter, and he was an alcoholic and um so he called back again seconds to a nine-year old who was asthmatic who went into respiratory arrest had called. Um, so basically there were no medic units available and there was an engine company on the scene doing CPR with a nine-year old and here we were with a homeless person in the field. That's the direct consequences we see on a daily basis…."
Challenges of Being an EMS Provider (Internal/ External)	"We're over-worked and underpaid…They need more medics…We don't even have the resources – we're just tired. We just get beat ...." "I would like to see something where if we find somebody who is at that point and they require help that we can… make the phone call or call our dispatcher at any time of night and say okay take her to… it doesn't have to be hospital; it can be at treatment."
Facilitators and Barriers to Study Participation and Outcomes	"We do have a certain advantage because a lot of times we wake up the addict and they found their bottom. They wake up and go 'Oh my God, I was dead and now I absolutely need to get help.' If we had some sort of resource where I could say, 'are you serious about getting help if I could get your help right now'…." "The average run takes an hour, and you're talking about 20 minutes between runs. I mean, trying to pile that on top – one, it's not going to get done very well, because we're going to get overwhelmed and annoyed with it…." "Total waste of time, waste of money, waste of resources. These people are not gonna get better until they want to get better... And until heroin is not on every single street corner and you can get – it is probably easier to get heroin in this city… than it is to get a job."
Suggestions for the Training, Intervention, and Study Implementation	"[Intervening with substance using patients] would make a difference if we were gonna take them somewhere different than the hospital... But there's no clinic in the world that's going to take somebody we just had to give two milligrams of Narcan to wake 'em up… There's no place in the world that's gonna take them… half these clinics won't take them if they're high." "Until you motivate the paramedics to make it worth their while to cooperate with the system and you communicate the benefits of that to them you not going to get a lot of buy in…."

Table 2. Illustrative Quotations from Participants Presented by Theme

substance-using patients. Several mentioned that because they are usually the first responders on the scene of drug- and alcohol-related emergencies, and thus have direct contact with the population:

> "Well, we're paramedics, social workers, fathers, mentors. We play a lot of hats, because we are the first ones to arrive when someone calls for help. I think we should [intervene], because we're always the first one there."

In a similar vein, several providers agreed that when their overdose patients have been revived from overdose, and/or reach their "bottom," they may be receptive to seeking help at that moment. Interviewees emphasized that this moment should be seized upon, because substance users may not be receptive to encouragement to seek treatment at other times:

> "We do have a certain advantage because a lot of times we wake up the addict and they found their bottom. They wake up and go 'Oh my God, I was dead and now I absolutely need to get help.' If we had some sort of resource where I could say, 'are you serious about getting help, if I could get your help right now'…."

A second facilitator would be the incorporation of the proposed study intervention into the existing workflow that EMS providers have. Most providers indicated that they already ask patients about their drug and alcohol use to assess their medical history and that screening questions could easily be incorporated. They suggested this could be done systematically by making the study questions required data fields in the electronic data collection platform currently being used.

A formidable barrier identified by EMS providers was their perceptions that many of their patients are unreceptive and/or cannot change. Several providers stated that their efforts to screen patients and deliver brief motivational interventions would not be worth the effort, as many patients would not be amenable to listening or to changing their habits. In general, when providers were willing to intervene, they expressed more willingness to intervene with younger people, as well as opiate addicts, because they could be revived and coherent:

> "I would say I am more likely to probably try to talk to a young opiate addict than I am an alcoholic…. Once they get to [their 50 s] they're not receptive… they certainly don't want to be lectured to by somebody half their age."

Several providers stated that they no longer reach out to addicted patients to encourage them to seek help, partly because they are rarely exposed to success stories of patients who recover:

> "There's a little tiny ray of hope that's like once in every three years… we had a guy, an alcoholic, that was two-three times a day, sober for four years. And guess who was picked

https://doi.org/10.1017/S1049023X16001424 Published online by Cambridge University Press

up via 9-1-1 four times in one day last week? This guy is back after four years of sobriety."

Another major barrier expressed by providers was lack of infrastructure for patient intervention. They expressed little knowledge and/or training about substance abuse treatment modalities and logistics, and limited means to research this. They also feared negative repercussions:

"They could actually get p—enough to call the—number for the city and say you were mean to them and then I'm down here at the shift commander's office explaining why I was rude to a patient…. you know, 'No, but I was just telling them that they probably shouldn't do heroin anymore it's bad for them.' 'Well, that's not your place, your place is to take care of them and take them to the hospital,' is what they'd tell me."

Theme 4: Suggestions for the Training, Intervention, and Study Implementation—Several EMS providers endorsed the idea of an alternative facility for substance-using patients who need to sober up or to be monitored after being revived, as opposed to current protocol which is transporting patients to the ED. Providers also suggested that these centers could be linked to drug treatment center programs, because long wait times for current substance abuse programs often deter patients from entering treatment:

"I would like to see something where if we find somebody who is at that point and they require help that we… would be able to make the phone call or call our dispatcher and any time of night and say okay take her; it doesn't have to be a hospital it can be…."

Next, providers stressed the importance of collaboration to encourage participation of EMS providers. For example, several suggested that team members and collaborators go on "ride-alongs" to accompany providers during transports and to better understand their processes:

"Yeah, I figure if you guys can get to a realistic understanding of what it's like then maybe you guys can tailor some of this a little more workable."

Participants offered a few additional suggestions related to the implementation of the intervention, such as small information cards that are wallet-sized rather than pamphlets that might be lost or thrown away. Others expressed that simply being provided information to enhance their ability to intervene with patients would be helpful, particularly to account for issues such as differing levels of patient education and literacy:

"Training with our paramedics on how to approach the subject in a way that still respects the patient privacy that's non-discriminatory, and that's probably the key."

Similarly, many could not recall having any specific training in substance abuse or addiction, despite their daily contact with patients dealing with these issues. Finally, providers suggested that these trainings should be run in part by EMS providers, particularly if they have relevant experience with the population. For example, several providers disclosed personal experience with addiction themselves, or with loved ones. Similarly, several stressed the importance of interdisciplinary collaboration, including hospitals, homeless shelters, and the health department:

"I think it's probably going to be a collective group, because everybody's going to bring certain expertise… like I can tell you about the EMS, but… somebody come in with the social work, somebody come in with the drug rehab or counselor… you might even have somebody that's a reformed addict, you know, a success story… and then like maybe one of you guys… can just tie the whole thing together."

Discussion

The purpose of the present research was to understand the demands of EMS providers who serve substance users in an urban area, and their willingness to participate in a novel intervention with this population. This investigation yielded rare insights into the processes and demands of engaging prehospital health care providers in research, thereby addressing a critical gap in the literature.[1,11,40,43-45] Moreover, the results highlight several significant findings, which will inform the future brief invention to train EMS providers to screen substance-using patients for substance dependence and connect them to substance treatment programs and resources in Baltimore City. Findings also have larger implications for prehospital research in urban settings.

First, providers stated that in their experiences, a small number of patients comprised a large amount of EMS calls, many of which were non-emergent cases. The study participants reported that older, male, substance-using patients were the most likely to misuse and over-use EMS in Baltimore City. Known as the "frequent flyer" problem, similar populations have been shown to over-use and misuse EMS in larger studies, particularly elder patients with behavioral conditions.[15-22] Therefore, future intervention with EMS over users in Baltimore must address the health concerns of older populations, including both physical health function and mental health and quality of life-related factors.

Providers identified another key point in treating substance-using patients, which was lack of adequate resources in the community, particularly among those familiar with substance treatment programs in Baltimore City. Providers expressed disappointment with the limited number of slots in substance use treatment centers in the city, and also over-crowded health centers. However, several noted that these barriers are socio-economically-dependent, and therefore present among the disadvantaged populations that they serve. Similar findings have been established in a wealth of previous research, suggesting that EMS use and over-use is most common and problematic among racial/ethnic minorities with limited access to social services[25-28] and individuals with a history of chronic homelessness.[24] Therefore, interventions in this population should be mindful of these socio-economic barriers to engagement in substance treatment; further, they must be mindful of resource limitations in urban settings, in terms of both substance treatment availability and demands of EMS providers currently caring for these patients.

A related systems-level barrier expressed by providers was lack of communication within the infrastructure of the BCFD to EMS providers. Several individuals expressed disappointment with top-down mandates, many of which are not mindful of their workflow and daily demands. Though the literature is sparse, research suggests that systems-level barriers have potentially far-reaching impacts. Previous studies of EMS personnel found that high work demands and lack of attention from upper

https://doi.org/10.1017/S1049023X16001424 Published online by Cambridge University Press

administration were barriers to job satisfaction, and may ultimately lead to employee turnover.[59,60] Similarly, administration and workforce shortages are often cited systems-level barriers to prehospital research.[1,11]

In consideration of these obstacles, the present research assessed EMS providers' views of facilitators of engaging in novel research to test the feasibility of a brief screening and motivational interviewing intervention among substance-using patients who utilize EMS. An important suggestion from providers was to incorporate intervention components into existing workflow and protocols. Providers cited the importance of having research team members complete "ride-alongs" to facilitate this process. As noted by several studies, including Lerner and colleagues, facilitation of intervention implementation via EMS workflow management is a necessary prerequisite to conducting research in EMS settings.[40,43,45]

Finally, providers self-identified their roles as "first responders" with direct contact with substance-using patients who may need drug treatment programs and informational resources. Mahabee-Gittens and colleagues found that "study champions" greatly facilitated uptake of a tobacco intervention in a large inner-city ED.[38] While prehospital settings are understudied in comparison, it is possible that study champions – or research advocates invested in the program – also are needed. Emergency Medical Service providers may be uniquely positioned to serve in such a capacity.

Limitations

The present research is subject to several limitations. First, the interviews were conducted with EMS providers and centered around sensitive topics such as work morale and their perceptions of drug use. While the researchers ensured confidentiality for all participants, it is possible that social desirability and/or fear of punishment prevented participants from disclosing more information. Second, although it was an empirically-informed methodological decision to limit the scope to abuse of alcohol and opioids, this limits the generalizability of the findings. Third, the providers were mostly white Americans, highly trained, and only represented two fire stations in the city. While EMS providers are not required to routinely report their race on job applications and/or for surveillance, EMS work force reports from the last decade suggest that white Americans do comprise the majority, which is in-keeping with the study sample.[61] Nonetheless, it is possible that contextual factors would differ among other providers and/or other areas of Baltimore. Therefore, including more diversity of personnel (eg, age, race, and training) and areas of Baltimore in future research also would increase the external validity of findings.

Conclusions/Future Utilizations

Despite study limitations, the present study is one of few to explore the views of EMS providers on substance-use-related EMS use in Baltimore City. This research is novel, given extant research usually evaluates ED providers rather than prehospital care. Findings suggest that, in the context of Baltimore City, substance-using patients may comprise many of the medically unnecessary EMS transports in the area. To that end, less than 10% of substance users in treatment currently are being referred by EMS and other health care providers.[14] This may be because they are not trained to care for behavioral health conditions and experience frustration as a result of this and overall job demand.[19,60,61] One possible solution to this issue is the proposed intervention, whereby EMS providers will receive training to screen patients for substance dependence and deliver a brief motivational intervention to encourage these patients to enter drug treatment programs.

Study findings will be utilized in several key ways during Phase II. First, the proposed intervention will help to address the "frequent flyer" problem identified by providers by addressing their gap in knowledge on substance-use treatment services in Baltimore City. Next, inclusion of EMS providers in all subsequent training sessions will be maximized, including having BCFD leadership on study communications. This will also hopefully mitigate some of the fear of negative repercussions from supervisors that several providers expressed. Finally, several individuals on the study team will complete "ride alongs," during which the team will accompany EMS providers during routine transport to learn their current workflow. The knowledge gleaned in this study might ultimately create linkage points to social services through EMS providers to better serve disadvantaged, substance-using populations. Ongoing partnership with BCFD and EMS and innovation ultimately can improve health outcomes among substance-using patients and the development and implementation of new effective interventions. This ultimately will help reduce the costs and burden associated with EMS overuse and misuse in urban settings.

Supplementary Material

To view supplementary material for this article, please visit https://doi.org/10.1017/S1049023X16001424

References

1. Lowthian JA, Cameron PA, Stoelwinder JU, et al. Increasing utilization of emergency ambulances. *Aust Health Rev*. 2011;35(1):63-69.
2. National Academy of Medicine (NAM). *Emergency Medical Services: At the Crossroads*. Washington, DC USA: The National Academies Press; 2007.
3. Richard ME, Hubble MW, Zwehl-Burke S. "Inappropriate" pediatric Emergency Medical Services utilization redefined. *Pediatr Emerg Care*. 2011;27(6):514-518.
4. Weber EJ, Showstack JA, Hunt KA, et al. Are the uninsured responsible for the increase in emergency department visits in the United States? *Ann Emerg Med*. 2008;52(2):108-115.
5. Weaver MD, Moore CG, Petterson PD, Yealy DM. Medical necessity in Emergency Medical Services transports. *Am J Med Qual*. 2012;27(3):250-255.
6. Tang N, Stein J, Hsia RY, Maselli JH, Gonzales R. Trends and characteristics of US emergency department visits, 1997–2007. *JAMA*. 2010;304(6):664-670.
7. Camasso-Richardson K, Wilde JA, Petrack EM. Medically unnecessary pediatric ambulance transports: a medical taxi service? *Acad Emerg Med*. 1997;4(12):1137-1141.
8. Cone DC, Schmidt TA, Mann NC, Brown L. Developing research criteria to define medical necessity in Emergency Medical Services. *Prehosp Emerg Care*. 2004;8(2):116-125.
9. Cone DC, Benson R, Schmidt TA, Mann NC. Field triage systems: methodologies from the literature. *Prehosp Emerg Care*. 2004;8(2):130-137.
10. Brown LH, Hubble MW, Cone DC, et al. Paramedic determinations of medical necessity: a meta-analysis. *Prehosp Emerg Care*. 2009;13(4):516-527.
11. Leonard JC, Scharff DP, Koors V, et al. A qualitative assessment of factors that influence Emergency Medical Services partnerships in prehospital research. *Acad Emerg Med*. 2012;19(2):161-173.
12. Kost S, Arruda J. Appropriateness of ambulance transportation to a suburban pediatric emergency department. *Prehosp Emerg Care*. 1999;3(3):187-190.
13. Rosenberg N, Knazik S, Cohen S, et al. Use of Emergency Medical Service transport system in medical patients up to 36 months of age. *Pediatr Emerg Care*. 1998;14(3):191-193.
14. Substance Abuse and Mental Health Services Administration SAMHSA, Office of Applied Studies. *Results from the 2008 National Survey on Drug Use and Health: National Findings*. Rockville, Maryland USA: NSDUH Series H-36, HHS Publication No. SMA 09-4434; 2009.
15. Brady WJ Jr, Hennes H, Wolf A, et al. Pattern of Basic Life Support ambulance use in an urban pediatric population. *Am J Emerg Med*. 1996;14(3):250-253.

16. Pines JM, Mullins PM, Cooper JK, Feng LB, Roth KE. National trends in emergency department use, care patterns, and quality of care of older adults in the United States. *J Amer Geriatr Soc*. 2013;61(1):12-17.
17. Bender DS, Skodol AE, Pagano ME, et al. Brief reports: prospective assessment of treatment use by patients with personality disorders. *Psychiatr Serv*. 2006;57(2): 254-257.
18. Davydow DS, Hough CL, Zatzick D, Katon WJ. Psychiatric symptoms and acute care service utilization over the course of the year following medical-surgical ICU admission: a longitudinal investigation. *Crit Care Med*. 2014;42(12):2473-2481.
19. Rees N, Rapport F, Snooks H. Perceptions of paramedics and emergency staff about the care they provide to people who self-harm: constructivist meta-synthesis of the qualitative literature. *J Psychosom Res*. 2015;78(6):529-535.
20. Ondler C, Hedge GG, Carlson JN. Resource utilization and health care charges associated with the most frequent ED users. *Am J Emerg Med*. 2014;32(10): 1215-1219.
21. Lee MH, Schuur JS, Zink BJ. Owning the cost of emergency medicine: beyond 2%. *Ann Emerg Med*. 2013;62(5):498-505.
22. Durant E, Fahimi J. Factors associated with ambulance use among patients with low-acuity conditions. *Prehosp Emerg Care*. 2012;16(3):329-337.
23. Squire BT, Tamayo A, Tamayo-Sarver JH. At-risk populations and the critically ill rely disproportionately on ambulance transport to emergency departments. *Ann Emerg Med*. 2010;56(4):341-347.
24. Blank FS, Li H, Henneman PL, et al. A descriptive study of heavy emergency department users at an academic emergency department reveals heavy ED users have better access to care than average users. *J Emerg Nurs*. 2005;31(2):139-144.
25. Oates G, Tadros A, Davis SM. A comparison of national emergency department use by homeless versus non-homeless people in the United States. *J Health Care Poor Underserved*. 2009;20(3):840-845.
26. Xu KT, Nelson BK, Berk S. The changing profile of patients who used emergency department services in the United States: 1996 to 2005. *Ann Emerg Med*. 2009; 54(6):805-810.
27. Knowlton AR, Weir BW, Hughes BS, et al. Patient demographic and health factors associated with frequent use of Emergency Medical Services in a Midsized City. *Acad Emerg Med*. 2013;20(11):1101-1111.
28. O'Toole TP, Pollini R, Gray P, Jones T, Bigelow G, Ford DE. Factors identifying high-frequency and low-frequency health service utilization among substance-using adults. *J Subst Abuse Treat*. 2007;33(1):51-59.
29. Knowlton A, Weir BW, Hazzard F, et al. EMS runs for suspected opioid overdose: implications for surveillance and prevention. *Prehosp Emerg Care*. 2013; 17(3):317-329.
30. Rinke ML, Dietrich E, Kodeck T, Westcoat K. Operation care: a pilot case management intervention for frequent emergency medical system users. *Am J Emerg Med*. 2012;30(2):352-357.
31. Mandelberg JH, Kuhn RE, Kohn MA. Epidemiologic analysis of an urban, public emergency department's frequent users. *Acad Emerg Med*. 2000;7(6):637-646.
32. Billings J, Raven MC. Dispelling an urban legend: frequent emergency department users have substantial burden of disease. *Health Aff*. 2013;32(12):2099-2108.
33. Szekendi MK, Williams MV, Carrier D, Hensley L, Thomas S, Cerese J. The characteristics of patients frequently admitted to academic medical centers in the United States. *J Hosp Med*. 2015;10(9):563-568.
34. DiPietro BY, Kindermann D, Schenkel SM. Ill, itinerant, and insured: the top 20 users of emergency departments in Baltimore city. *Sci World J*. 2012;2012:726568.
35. Pines JM, Asplin BR, Kaji AH, et al. Frequent users of emergency department services: gaps in knowledge and a proposed research agenda. *Acad Emerg Med*. 2011; 18(6):e64-e69.
36. LaCalle E, Rabin E. Frequent users of emergency departments: the myths, the data, and the policy implications. *Ann Emerg Med*. 2010;56(1):42-48.
37. Schnall R, Clark S, Olender S, Sperling JD. Providers' perception of the factors influencing the implementation of the New York State mandatory HIV testing law in two urban academic emergency departments. *Acad Emerg Med*. 2013;20: 279-286.
38. Mahabee-Gittens EM, Dixon CA, Vaughn LM, Duma EM, Gordon JS. Parental tobacco screening and counseling in the pediatric emergency department: practitioners' attitudes, perceived barriers, and suggestions for implementation and maintenance. *J Emerg Nurs*. 2014;40(4):336-345.
39. Schmidt TA, Nelson M, Daya M, Delorio NM, Griffiths D, Rosteck P. Emergency Medical Service providers' attitudes and experiences regarding enrolling patients in clinical research trials. *Prehosp Emerg Care*. 2009;13(2):160-168.
40. Sayre MR, Gausche-Hill M. Conducting randomized trials in the prehospital setting. *Prehosp Emerg Care*. 2002;6(S2):S38-S47.
41. Lerner EB, Weik T, Edgerton EA. Research in prehospital care: overcoming the barriers to success. *Prehosp Emerg Care*. 2015;20(4):448-453.
42. Brice JH, Garrison HG, Evans AT. Study design and outcomes in out-of-hospital emergency medicine research: a ten-year analysis. *Prehosp Emerg Care*. 2000;4(2): 144-150.
43. Lerner Mosesso Jr. V, Zak C. Implementation of research in the out-of-hospital setting. *Prehosp Emerg Care*. 2002;6(S2):S24-S27.
44. Williams B, Perillo S, Brown T. What are the factors of organizational culture in health care settings that act as barriers to the implementation of evidence-based practice? A scoping review. *Nurs Educ Today*. 2015;35(2):e34-e41.
45. Callaham M. Quantifying the scanty science of prehospital emergency care. *Ann Emerg Med*. 1997;30(6):785-790.
46. Baltimore Substance Abuse Systems. Outlook and Outcomes FY 2011. http://www.bhsbaltimore.org/site/wp-content/uploads/2012/06/BSAS-Outlook-and-Outcomes-FY2011-07-16-2012-revision2.pdf. 2012. Accessed July 11, 2015.
47. Drug Strategies. Smart Steps: Treating Baltimore's Drug Problem. Drug Strategies: Washington, DC. 2000. http://www.drugstrategies.com/pdf/baltimore.pdf. Accessed July 12, 2015.
48. Substance Abuse and Mental Health Services Administration. *Drug Abuse Warning Network: Area Profiles of Drug-Related Mortality*. Rockville, Maryland USA: SAMHSA; 2008.
49. Cheal NE, McKnight-Eily L, Weber MK. Alcohol screening and brief intervention: a clinical solution to a vital public health issue. *Am Nurse Today*. 2014;9(9):34-35.
50. Cunningham RM, Bernstein SL, Walton M, et al. Alcohol, tobacco, and other drugs: future directions for screening and intervention in the emergency department. *Acad Emerg Med*. 2009;16(11):1078-1088.
51. Madras BK, Compton WM, Avula D, Stegbauer T, Stein JB, Clark HW. Screening, brief interventions, referral to treatment (SBIRT) for illicit drug and alcohol use at multiple healthcare sites: comparison at intake and 6 months later. *Drug Alcohol Depend*. 2009;99(1-3):280-295.
52. Krupski A, Sears JM, Joesch JM, et al. Impact of brief interventions and brief treatment on admissions to chemical dependency treatment. *Drug Alcohol Depend*. 2010;110(1-2):126-136.
53. Heather N. Can screening and brief intervention lead to population-level reductions in alcohol-related harm? *Addict Sci Clin Pract*. 2012;28(7):15.
54. Baltimore City Fire Department. Fire/BCFD Leadership Team. http://fire.baltimorecity.gov. Accessed June 1, 2016.
55. Creswell JW. *Qualitative Inquiry and Research Design: Choosing Among Five Traditions*. London, United Kingdom: Sage Publications; 2007.
56. Bigham BL, Aufderheide TP, Davis DP, et al. Knowledge translation in Emergency Medical Services: a qualitative survey of barriers to guideline implementation. *Resuscitation*. 2010;81(7):836-840.
57. Sasson C, Forman J, Krass D, et al. A qualitative study to understand barriers to implementation of national guidelines for prehospital termination of unsuccessful resuscitation efforts. *Prehosp Emerg Care*. 2010;14(2):250-258.
58. Glaser BG, Strauss AL. *The Discovery of Grounded Theory: Strategies for Qualitative Research*. New York, USA: Aldine De Gruyter; 1967.
59. Cydulka RK, Emerman CL, Shade B, et al. Stress levels in EMS personnel: a national survey. *Prehosp Disaster Med*. 1997;12(2):136-140.
60. Patterson PD, Probst JC, Leith KH, et al. Recruitment and retention of emergency medical technicians: a qualitative study. *J Allied Health*. 2005;34(3):153-162.
61. Maryland Institute for Emergency Medical Services Systems. Maryland EMS Work Force Report. https://www.miemss.org/home/Portals/0/Docs/OtherPDFs/EMS_Work_Force_Report.pdf?ver=2007-10-15-135038-000. Accessed July 11, 2015.